

COMPUTERWORD

Insurer cancels host policy

SystemPro network replaces mainframe/mini hodgepodge, slashing costs

BY CAROL HILDEBRAND
CW STAFF

COLUMBUS, Ohio — The Midland Mutual Life Insurance Co. is putting the final accents on a personal computer-based network that has turned its old data center into a company gymnasium. In the process, the \$1 billion company has flattened the organization and sliced information systems costs by several million dollars.

Goose is a conglomeration of an IBM 4381, two Hewlett-Packard Co. 3000 Model 70s, an

IBM System/36 and a Digital Equipment Corp. VAX 6210. In its place is a PC network anchored by 22 Compaq Computer Corp. SystemPro that serve about 315 clients. The system, in place since July 1991, is now getting the finishing touches as the company sends its big iron to the dump.

The difficulty of supporting various software packages for

each of the hardware platforms played a major role in the decision to downsize. The company converted data from the mainframe applications over to one standard, PC-based insurance application for all its business groups, but it did not attempt to port the host-based software itself. Jerry Wheatall, assistant vice president of corporate sys-

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HP aiming stations at office desktops

BY MARYFRAN JOHNSON
CW STAFF

CHELMSFORD, Mass. — While Hewlett-Packard Co.'s Unix workstations still play second fiddle to Sun Microsystems, Inc. in mainstream commercial accounts, HP's workstation division here is hatching new strate-

gies to step out of Sun's shadow.

An expected Sept. 15 announcement of more powerful new workstations based on HP's 7100 "Thunderbird" Precision Architecture-RISC chip — which doubles the clock speed of the current chip to 100 MHz — should give the vendor an even more compelling price/performance display for commercial customers.

Even so, only an estimated 15% of HP's \$1.6 billion workstation revenue last year came from sales to business environments. The bulk of the firm's revenue still comes from scientific and technical workplaces.

"The good news is that most of the commercial workstation opportunity is a green field opportunity," said Gary Eichhorn, general manager of HP's workstation systems group. "We are seeing a lot more business, more activity, more bids and more long-term projects."

Wanting it all

Commercial users said flashy performance is only a fraction of the larger equation involved in buying workstations. Hardware reliability, long-term costs of ownership, choice of software applications and reputation for

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MAINFRAME METAMORPHOSIS

'Old-timers' wrestle with dinosaur image

Second in a two-part series on mainframe computing.

BY MITCH BETTS
CW STAFF

For old-timers in information systems executive Curt Beaumont, the numbers told the story: hundreds of resumes sent out nationwide in 18 months, scores of job interviews and zero lack. That is how brutal the job market can be for IS executives with mostly mainframe experience.

"Because of my concentration on large mainframes, I became a dinosaur," said Beaumont, 47, who had to leave a 26-year IS career and a \$95,000 salary for a \$20,000 job as a cellular telephone consultant in Framingham, Mass. Money problems led to the breakup of his marriage and a new self-image. "I've had to downsize myself — my ego, expectations and

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Former mainframeer Fred Corey picked up PC skills on his own, which saved his career

Downsizing enticements

Storage savings:

A 622M-byte VAX RA91 disk drive costs about \$40,000. With PCs, The Midland can get four times the storage for one quarter the price.

System modularity:

Using one vendor (Compaq) lets The Midland shop in lower motherboard costs more easily.

Lights-out processing:

Batch jobs, like posting premium payments, can be activated by programmers from a PC at home.

Users doubt Wang's comeback potential

BY KIM S. NASH
CW STAFF

LOWELL, Mass. — Although Wang Laboratories, Inc.'s Chapter 11 bankruptcy protection filing last week shields the money-losing minicomputer firm from hungry creditors, it also erects a wall between Wang and its customers.

The majority of a dozen-plus users interviewed last week —

along with another 256 surveyed by the CW Database Division — said they are no longer comfortable doing business with Wang.

For VS faithfuls, including American Express Co., the Port of Seattle and W. R. Grace & Co., Wang's \$45.4 million operating loss for fiscal 1992 on sales of \$1.9 billion and subsequent Chapter 11 filing came as no surprise. It largely served to reconfirm plans to vacate the VS or re-

place Wang service with that of independent third parties, they said.

"We have a great deal of sympathy for Wang. I offered my condolences to [Chairman] Rick

Miller," said Marilyn Phillips, executive director at Haynes and Boone, a \$60 million Dallas-based law firm that is dumping seven VS models and 340 Wang

Continued on page 16

What to do?

How will Wang's bankruptcy affect your future plans?

291 responses from 256 users of Wang sites

Percent of responses

- We will look for a new vendor: 37%
- We will maintain existing Wang hardware for the short term: 34%
- Our purchase plans have not changed — we will stick with Wang: 20%
- We will rely on Wang only for software and services: 4%
- Don't know: 5%



Source: CW Database Division

INSIDE

Lotus may miss its year-end shipment schedule for 1-2-3 Release 2.0 for Windows. Page 4.

IBM confirms it will use the Mach 3 micro kernel instead of the NT kernel in the next generation of OS/2. Page 4.

Expecting an eight-year mainframe processor year from IBM? Don't hold your breath. Page 6.

CA, Novell seek to bring host systems management to networked PCs. Page 10.

Executive Report — Spin-offs: Turning IS into dollars. Page 81.

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#UW7E300#09039# 5-DIGIT 48103
0010109708
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SERIAL PUBLICATIONS
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- 6 User reaction is mixed as IBM announces that it will be late in delivering a multi-frame upgrade.
- 7 DEC announces a family of PCs that will offer upgradeability from 386DX to 486DX2 by swapping in daughtercards or CPUs.
- 8 Intecom to announce that it has integrated a variety of features into its Integrated Business Exchange FSX.
- 10 Computer Associates says it will port its CA-Unicenter systems management software to Novell's NetWare servers.
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Quotable

"This is the worst stretch of unemployment in the data processing field I've seen in 10 years."

ROGER O'CONNOR
EDWARD PERLIN
ASSOCIATES

On unemployment among IS professionals with mainframe backgrounds. See story page 1.

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■ Times are hard for IS professionals with mainframe backgrounds. Application downsizing has thrown many out of work and created the worst IS job market in 10 years, some recruiters say. The lucky ones are those who have sharpened skills in PCs and networking, where plenty of opportunity still exists. Page 1.

■ Wang scrambles to remake itself into a software/service company after filing for bankruptcy last week. Meanwhile, current VS minicomputer users are acting on contingency plans, with many set to move to IBM. Wang hopes its Office 2000 imaging-enabled office automation scheme will bring a smaller, leaner company back to life. Pages 1, 16, 17.

■ Hewlett-Packard cranks up efforts to sell Unix workstations to commercial sites, which today make up only 15% of its workstation business. One example: HP will start pushing client workstations to Series 800 server customers and the millions of LaserJet printer users. Page 1.

■ Many IS shops today share a common problem: Technology-cost estimates are missing their marks. A recent study of 115 organizations found that 63% of their projects went over budget. Tips for avoiding this fate include assigning the initial estimate to final developers, conducting feasibility studies and controlling user changes. Page 85.

■ IBM and Sears team up in hopes of becoming a powerhouse in the network outsourcing market. But the U.S.-oriented, Systems Network Architecture-centric venture may initially be at a disadvantage against global competitors. Page 10.

■ Microsoft and IBM were looking ahead at last week's Windows & OS/2 Conference. Microsoft is lining up troops to help push Windows NT into the market, and IBM is sketching out plans for OS/2's next generation, which will likely include the Mach 3 Unix kernel. Page 4.

■ Many user companies are trying to turn huge technology investments into cash by entering a hot new field: computerized distribution logistics. Companies spinning off for-profit distribution units include Roadway, Caterpillar, TNT Transport Group, Carolina Freight and Ryder Systems. Meanwhile,

older IS spin-offs enjoy mixed success. Page 81.

■ A plan by CA and Novell to link up in a "technology sharing" alliance drives excited reactions from users. Initial product plans will tie CA's Unicenter management tools to Novell's NetWare operating system. Page 10. Don't look for a trend in LAN management. The field remains fragmented, with users focusing on tools designed to manage a particular type of LAN. Page 69.

■ IBM delays its eight-way mainframe, originally planned for delivery late this year, until next year. Customer responses range from "ho-hum to 'Hell! I'm running out of horsepower!'" Page 6.

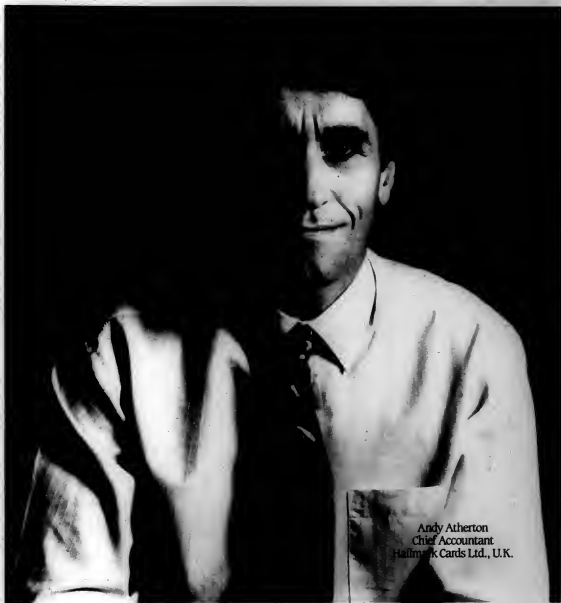
■ Imaging systems are making their mark in manufacturing firms, where they bring efficiencies in the handling of engineering drawings. Page 71.

■ Graphical user interfaces bring some cautions baggage, such as the need for high-performance graphics gear. Page 53.

■ On site this week: The Midland Life Mutual Insurance Co. believes in simplicity, so it junked a tangle of different vendors' minicomputers and mainframes in favor of a Compaq SystemPro-based local-area network. Page 1. The migration to open systems can be a bumpy road, as Hughes Electronics Space and Communications Division can attest. Page 72. It's a federal government success story at the U.S. Navy's Human Resource Office, where a local-area network-based personnel system is being used as a model for other agencies. Page 61.

The 5th Wave





Andy Atherton
Chief Accountant
Hallmark Cards Ltd., U.K.

"These days, the first thing a software company needs is a good pair of ears. That's what makes CA special. They listen. They care about what I have to say. I'm very happy with how they've improved our financial software solution...especially with the changes I recommended myself."



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Borland to flesh out IS initiative

BY MARK HALPER
CW STAFF

SCOTT VALLEY, Calif. — Borland International, Inc. this week will launch a series of support programs as part of an initiative to increase its presence in corporate accounts.

The software vendor will begin offering support contracts, including options for a compact disc (CD) read-only memory-based technical support database, a priority hot line that provides fast access to senior technical support engineers and a priority bulletin board service on CompuServe.

This week's programs are expected to be followed by new marketing alliances with systems integrators and by a series of corporate-oriented educational seminars (CW June 15).

Borland's corporate accounts program also includes revisions to its licensing program; these revisions are aimed at easing licensing restrictions to its products. Earlier this summer, the company entered into a licensing arrangement with Price Waterhouse under which the accounting firm will buy some 25,000 Borland products (CW July 27).

Among the programs to be launched are the following:

- The CD-ROM program, called Borland KnowledgeBase CD. It gives corporate and government customers and developers access to technical information on problem reports, workarounds and other detailed information on Borland products.
- Borland is providing one CD with information on its application products and another that supports its language products. It will charge \$495 a year.
- The Borland Priority Hot Line, priced at \$500 a year for its database and spreadsheet products and \$750 a year for Borland C++ object-oriented programming language, gives customers toll-free phone access to a technical engineer. The Borland VIP CompuServe Bulletin Board (\$500 per year) allows users to access all Borland forums and a special message board, and it includes a guaranteed four-hour response time to questions.
- The Borland Premium Support plan, which includes a comprehensive package of toll-free support, the CompuServe Bulletin Board and both KnowledgeBase CDs. The toll-free support and bulletin board include separate contacts for each of four Borland products: dBase, Paradox, Quattro Pro and C++. It is priced at \$3,995 per year.

Tardy 1-2-3 for Windows 2.0?

Lotus making sure new features make it more competitive with Excel 4.0

BY ROSEMARY HAMILTON
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. may miss its year-end shipment deadline for 1-2-3 for Windows Release 2.0, a company executive confirmed last week.

A Release 2.0 delay could be another setback for Lotus, which has been struggling to gain a strong foothold in the Microsoft Corp. Windows spreadsheet market since it arrived in 1991, already far behind Microsoft's lead and with an initially buggy product. However, Bob Holmes, a computer technology research analyst at Southern California Gas Co., said, "It would be better that they'd be late than deliver something like Release 1.0."

Frank Ingari, the company's vice president of marketing, said there "could be a modest adjustment" to the delivery schedule "but no major ones."

Slip-sliding away

In March, Lotus committed to a series of shipment deadlines for its spreadsheet products and promised to ship Release 2.0 by year's end. Release 2.0 is supposed to contain performance boosts and ease-of-use features.

as well as deliver the initial implementation of the Chronicle workgroup application technology.

The only thing I'll say is, something happened between then and now; Excel 4.0," Ingari said. In fact, he said the ship date may slip some because Lotus is re-viewing additional features to include in Release 2.0 that would make it competitive with Excel 4.0. He did not specify what those features might be.

They aren't showing they can out-innovate Microsoft in spreadsheet features," said Jeff Henning, an analyst at BIS Strategic Decisions in Norwell, Mass., who estimated that Lotus now holds about 24% of the Windows spreadsheet market.

Ingari said that any additional features under consideration are "on the fringe on the edge," adding that Lotus will not make major changes to the product. Ingari would not say when the



Lotus' Ingari: There could be a modest adjustment to the schedule

product would ship to beta-test sites, nor would he estimate how long the beta program would take other than to say that beta tests can run anywhere from 10 weeks to six months.

Bill Higgs, a vice president at Computer Intelligence/InfoCorp in Santa Clara, Calif., said he does not believe that the Chronicle technology could further complicate the beta-test program, even though it is the first time Lotus will be adding what he believes will be a workgroup features to 1-2-3. Higgs said Lotus has been demonstrating Chronicle for nearly a year and is likely working with stable code at this point. "But any time you do a major revision, and [Release 2.0] is one, you are looking at a beta period of two to four months," Higgs added.

Ingari also said Lotus would rather use the beta for missing the deadline than stick to the schedule and release a buggy product.

John Dunlap, president of Workgroup Technologies, Inc.

In addition, Walker said, Microsoft is on schedule to provide end users with beta-test copies beginning next month that it plans to ship to 100 users.

Both companies could not pass up an opportunity to take shots at each other. IBM said now that it had shipped 1 million copies of OS/2 2.0, and it is waiting for Microsoft to announce support for its applications.

Aimed at Microsoft, Walker's response was: "As long as they can run Windows apps, they have our support."

CORRECTIONS

Because of an editing error, Bill Wilson, IBM's assistant general manager, was inaccurately quoted in a story called "Big iron adapts to avoid getting the way of the dinosaur," (CW, Aug. 17). He said IBM "will have an eight-way processor sometime next year," and did not confirm a ship date of this year.

In the story "DRAM advances pave way for new adventures" (CW, Aug. 17), Mitsubishi was referred to as a licensee for Rambus' synchronous dynamic random-access memory. In fact, Mitsubishi has developed its own and competes with Rambus.

Sun cuts sales tags

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. was active last week on several fronts, rolling out announcements on price cuts, multimedia training tools and its own "rightising" project with Oracle Corp.

The company unveiled price reductions of 10% to 35% for its mail-order SunExpress products and began shipping the first in a series of multimedia, on-line training tools for first-time Sun users.

Sun also highlighted its in-house "rightising" project with Oracle. This joint development effort is focused on creating the next generation of Oracle's financial and manufacturing facilities worldwide by 1994.

The companies are billing their efforts as the first time a distributed computing environment will address multilite, multiplatform and multilingual requirements for a global manufacturing network.

Optimal usefulness

Sun is replacing its current set of mainframe-based database management system software with the Oracle 7 product. The code-workgroup tool will optimize Oracle's manufacturing and financial applications for the Sun 600 MP line of multiprocessor servers.

The mail-order price plunge moved SunExpress, one of Sun's subsidiaries, from list pricing to "street pricing" for customers ordering a variety of peripherals and software packages by phone. SunExpress includes more than 1,000 products from Sun and third-party suppliers.

The multimedia training set, called SunTru, combines on-line audio, video, text, graphics and simulation in a self-paced training course that condenses more than 16 hours of classroom lectures. The set is scheduled to ship next month, priced at \$395 for a single user, with 10- and 100-user site licenses available at \$1,995 and \$4,995, respectively.

"Sun has done a nice job getting on-line documentation on CD-ROMs, which makes it much more accessible for users," said Tom Kuchavsky, president of Summit Strategies, Inc. in Boston.

Kuchavsky noted that other workstation vendors, Hewlett-Packard Co. in particular, are also expected to take advantage of multimedia training tools to make their machines easier to use.

IBM, Microsoft reveal plans for next-generation systems

BY ROSEMARY HAMILTON
CW STAFF

BOSTON — IBM and Microsoft Corp. used the Windows & OS/2 Conference, held here last week, to reveal more of their battle plans for the desktop.

IBM, riding high on its claims of 1 million OS/2 2.0 shipments,

Windows & OS/2

said work is under way for the next-generation OS/2 and that the company will likely proceed with the Mach 3 micro kernel from Carnegie Mellon University instead of the Microsoft Windows New Technology (NT) kernel.

"It's not out of the question," while the Mach kernel is the "likely foundation...to move to an architecture of portability and much more object-oriented technology," said Fernand Sarraz, assistant general manager in charge of market development in the Personal Systems Group.

"This would move them somewhat more toward the Unix camp and could give them a more

portable operating system," said Bill Higgs, a vice president at Computer Intelligence/InfoCorp in Santa Clara, Calif.

The micro-kernel architecture will allow IBM to build a core operating system and service layer on which the "OS/2 personality and AIX personality" could be built, Sarraz said.

Microsoft, meanwhile, said it is putting together an NT infrastructure that will help propel the 32-bit operating system to the market.

Dwayne Walker, the company's director of Windows NT and networking products, said the up-front work could be "1.0 schnitzing," meaning the big time after new software is shipped before users are hesitant to embrace it.

Microsoft will unveil details next month on partnerships, channel strategies and training plans, Walker said. For instance, Sequent Computer Systems, Inc. is expected to soon announce its support of NT to run on its multiprocessor systems.

"They are putting in place the background works so they aren't left sitting without applications to take advantage of NT," said

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're having the differences between all the machines out on the network running on various platforms."

Bill Gates
Chairman and CEO
Microsoft Corporation



"ORACLE's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation



"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

"ORACLE7 is really solving the complexities of the distributed computing environment cost-effectively. Plus, it supplies the reliability and security that are required in a distributed computing environment. In fact, because ORACLE7 matches Sun's client-server model so well, we have chosen ORACLE7 as one of our key databases."

Scott G. McNulty
President, CEO and
Chairman
Sun Microsystems, Inc.



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NEWS SHORTS

Landmark Systems lays off 36

Fearing some fiscal pressure as it attempts to broaden its mainframe-centric focus, Landmark Systems has laid off 36 people, about 15% of its work force. Kathy Clark, senior vice president and co-founder, said the firm is refocusing its strategy to emphasize performance management products across all platforms, not just mainframes. Clark said the firm has also laid a new vice president of development and technology, John Hunter, a 23-year IBM veteran who most recently was IBM's director of communications architecture [CW, Aug. 17].

DEC, Ingres and bundling deal

Digital Equipment Corp. and the Ingres Products Division of The Ask Cos. announced last week that DEC's Ultrix operating system will now be bundled with DEC's Ultrix operating SQL. A new arrangement went into effect last week by which Ingres will provide a migration kit to Ingres 6.4, the latest release of the Ingres relational database management system, for licensed Ultrix SQL customers. It will also provide a migration path from Ultrix to DEC's OSF/1 operating system. Oracle Corp. is offering a migrating kit for Ultrix SQL users to the Oracle RDBMS. DEC plans to port its Rdb to OSF/1.

Unix companies get together

System Software Laboratories, Inc. (SSL) last week struck a deal with The Santa Cruz Operation (SCO) that aims to increase the number of Unix applications on the market. Under the agreement, SSL will supply the SCO with a host of application development tools, which SCO will include in future versions of SCO Unix, SCO Open Desktop and SCO C+++. The deal essentially adds another convert to SSL's Unix Systems V Release 4 operating system. The SCO's installed base of 700,000 Unix systems is based on an earlier version of System V Unix.

Humana cuts back, plans it spin-off

Humana, Inc. last week disclosed that it would trim its administrative staff by 400—a move that will likely affect information systems operations, according to a company spokesman. The health care firm will launch an information technology subsidiary Oct. 1 that will offer quality assurance, technology assessment and management of clinical information systems to the hospital industry. The mid-month retirement of Humana IS director Fred Pirman Jr. is unrelated to either the layoffs or the reorganization. However, Pirman's office will remain vacant until the effect of both moves on internal IS can be determined.

Toshiba joins notebook price war

Nest Monday, Toshiba America Information Systems, Inc. will attempt to shed its premium price image in the notebook computer market, according to sources close to the company. Toshiba plans to introduce three new systems, including an Intel Corp. 80386SX-based notebook with 2M bytes of random-access memory and a 60M-byte hard drive and two systems based on the 25-MHz 386SX. Street prices could start as low as \$1,500.

Short takes

Last week, F. Grant Saviers, recent vice president of DEC's PC systems and peripherals, left DEC to become chief operating officer at Adaptec, Inc., a Milpitas, Calif.-based vendor of Small Computer Systems Interface host adapters for PCs. . . . Autodesk, Inc. divested itself of two companies that made up its Information Systems Division: American Information Exchange (Amix) and Kanadu Operating Co. Amix will continue its operations as an independent purveyor of digitally stored information. . . . Genie, an on-line service provided by General Electric Co., announced a new on-line RoundTable network for Microsoft Corp. Windows and New Technology users, developers and analysts that is independent of Microsoft and is slated to be open for public access today. . . . Xerox, Inc. announced the premium Ethernet Adapter, a PCMCIA flash-memory card that lets users connect to an Ethernet 10Base-T network. Pricing is expected to be about \$445.

More news shorts on page 14

IBM 8-way processor delayed

BY JOHANNA AMBRISIO
CW STAFF

SOMERS, N.Y.—IBM will not deliver a mainframe upgrade in the fourth quarter as originally planned. Instead, the company will unveil the new processor sometime early next year.

Speculation varied about why the date slipped, with some observers pointing to possible technical problems and others saying that the decision had more to do with marketing. A company spokesman confirmed that the much-vaunted eight-processor model will not be announced until next year and said that in any case, the processor is not late. "We have not committed to customers either announcement dates or delivery dates of the eight-way."

Customer reactions were mixed. Some said they were fast running out of mainframe horsepower, would soon need to make a decision about what to do and might look at non-IBM machines as alternatives. Others said the slippage would not affect them.

The new processor is said to compute about 410 million instructions per second (MIPS) vs. about 235 MIPS for the current top-of-the-line Enterprise System/9000 Model 900. Each of the eight processors will handle

about 50 MIPS, compared with 40 MIPS in today's models, which has a maximum of six processors.

One customer said IBM approached him about taking early delivery "by year's end, and we considered it. We made no commitments, but they never got back to us," the user said. "If someone is not trying to close the deal, the product is probably not for sale."

Hanging on

Tom Leone, vice president of computers and communications at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla., said he is installed a Model 640 last month to complement the Model 900 Alamo already had. He said he was looking forward to the new machine in order to consolidate everything onto one processor. "We're OK until the end of the year, but by Washington's birthday, I will need more capacity. I'll have to do something about that—maybe upgrade the 640 or get another machine."

Doug Uhlrich, vice president at CSX Technology in Jacksonville, Fla., said the delay would have "no impact" on his shop. "There is an appeal to be made to pack more work loads into a single processor. But it wasn't something that I need

right now."

Observers cited different causes for the delay. Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn., said IBM's European operation disagreed with the decision to announce the new processor this year because it would disrupt the momentum of sales for the existing ES/9000 models. The firm will likely announce the machine in April, to ship by July, he said.

Jay Stevens, an analyst at Dean Witter Reynolds in New York, suggested that the delay might be due to technical problems with getting the MVS operating system to run across eight processors as a single unit. "IBM engineers have told me that they've had difficulties getting MVS tuned for the eight-way," he said. "But Amblin has said 'No way, so I don't know who's speaking truth.' Nevertheless, Stevens said, he still expects IBM's new machine to be introduced in February and to be available by March.

But Amstar Corp., which has promised its eight-way for the fourth quarter, may beat IBM to the punch. "That would be embarrassing for IBM," Stevens said. "The only customers who are going to be in a tight spot right now are the largest ones—the most important."

Insurer cancels host policy, chooses SystemPro network

CONTINUED FROM PAGE 1

terms at The Midland, acknowledged that the job was a big one. However, he said it was broken down into three stages during the course of about seven months from the end of 1990 to June 4, 1991, when the final mainframe data came over.

"We were building a Tower of Babel," Whettnall said. "I wanted to get to a single platform."

Whettnall added that although the company did take a financial hit when it had to buy out the leases on the big boxes, it made the money back within 18 months. "If I had stayed with the old system, my data processing expenses this year would have been about \$6 million," he said. "With the downsizing, it's just under \$2 million. You can justify this stuff real easy."

"I can buy an entire 1.28G-byte system for less than I paid for a disk drive for a WAX," Whettnall added.

The end result has been both a money-saver and a business enhancer, he said. Overall, staff dropped from 350 to 205. Whettnall said his IS staff plummeted from 55 to today's high of 20 as a result of the downsizing. He has

also decentralized his staff as the units moved apart.

Each unit has a couple of programmers assigned specifically to it that report to the general manager of that unit. This way, each group is free to concentrate on its priorities without having to wade through a centralized IS bureaucracy.

"I end up being the auditor, standards enforcer and chief of police," Whettnall said.

He said the mandate for change began as the 86-year-old firm reorganized itself into four separate business units in 1990. The impetus for that reorganization came from the chairman of the board at the company, which had a total of about 150,000 policies last year and plans to grow its business by about 10% this year.

Cheryl Currid, president of consultancy Currid & Co., pegged such high-level support as vital. "If you don't have top management that can make the leap of faith to say, 'Go ahead and try it, you'll never get out of the starting gate,'" she said.

Whettnall said a major problem with a centralized data cen-

ter was that when one group had a special need or upgrade, the other units suffered as well.

With the new setup, the servers are divided among each group; each unit has one server that handles standard business applications such as word processing, one or two servers that run the customized administration software for the insurance business and a test server that lets Whettnall try out any firm or enhancements without having to use the actual production system.

He said the relatively low cost of PC servers enables him to easily afford the redundancy.

Dividing his system this way gives Whettnall the flexibility to separately address different business needs, as well as add and subtract staff support and computing power as needed, he said.

The system runs Novell, Inc. NetWare v3.11 over an Ethernet network with a fiber-optic backbone and coaxial connections to the workstations. Whettnall said he is looking to convert to a complete fiber-optic network by next year.

The Midland's 18,000 insurance brokers, scattered across the country, access the system via a wide-area network linked into CompuServe. "They just call the local CompuServe number and get routed onto our set of servers," Whettnall said.

Grid convertible revs up pen market

Combination notebook/pen-based tablet may draw sales where other products failed

BY MICHAEL FITZGERALD
CW STAFF

FREMONT, Calif. — Grid Systems Corp. will expand its pen computing line in the early fall with a hybrid product that it hopes will succeed where rival Momenta International, Inc. failed, sources said.

The Grid "convertible" will combine a pen-based tablet with a notebook computer, the sources said. Based on Intel Corp.'s low-power 20-MHz 80386SL chip, the device will feature two to three

hours of battery life and a 120M-byte hard disk, as well as a back-lit screen. The product will also have two Personal Computer Memory Card International Association drives for flash-memory devices and is expected to be priced at \$2,995, the sources said.

Momenta, which was the first company to produce a combined pen and notebook computer system, drew little interest, in part because its sleek machine uses a proprietary operating system and costs more than \$5,000.

Surprisingly, the Grid machine is not expected to come with PenLight, Grid's operating environment. Instead, it will offer Go Corp.'s PenPoint or Microsoft Corp.'s Windows for Pen Computing software.

Sources described the system as between 2 in. and 2½ in. thick, slightly thicker than the normal notebook. From above, a user would see what appears to be just a screen with a pen, but pressing two indentations, one on each side of the screen, tilts the screen up and locks it into

place behind the keyboard.

"It's a no-compromises notebook that also comes with a pen," one source said.

Kenneth L. Dulany, Grid's director of laptops/pen-based marketing, refused to comment on specifics but did say, "We will have a pentap product by the end of the year."

Sources close to Momenta, meanwhile, said the company has ceased operations. One source said Momenta has not declared bankruptcy but has fired all but one employee and is trying to sell its technology.

Last week, Momenta's phones were being answered by a Momenta-employed receptionist, but Angelo Pensani, Momenta's spokesman, did not return repeated calls.

DEC to give PCs modular upgrades

BY MELINDA CAROL BALLEW
CW STAFF

MATNARD, Mass. — Digital Equipment Corp. will announce a new family of personal computers that offer a modular upgrade path across the line.

Dubbed the DECpe LP family, the products can be upgraded from 386DX to 486DX to 486DX2 processors by swapping in daughtercards or CPUs. They range in price from \$899 to \$2,199.

"While other vendors also have a modular approach, DEC's plan is to offer a single product family from the low to the high end, that will allow users to make upgrades by merely replacing the CPU daughtercard," said Steve Widen, an analyst at WorldGroup Technologies, Inc. in Hampton, N.H.

DEC will maintain seven worldwide integration centers with inventories of common parts. Users will have fast access to upgraded systems via daughterboards.

Definite draw

Some users praised DEC's pricing and the modularity of the new PCs. "The modularity of the systems would be a selling point for us. To be able to upgrade without trashing everything would be helpful," said John Linagelli, an analyst at Eliot Hospital in Manchester, N.H.

"It sounds as if this pricing brings them more in line with the competition," added Bill Lodge, project manager at Turner Corp., a non-DEC user in New York that recently downsized from IBM mainframes to Banyan Systems, Inc.'s Vines PC networks. "DEC has interesting products coming down the line with the Alpha chip and support of NT, but until now they've never had a serious presence in the PC market."

Others were skeptical, however, about DEC's strategy and its ability to win over non-DEC sites.

"DEC has improved their PC line, but when they pressed us to go with their PCs as a big DEC and big IBM account, we turned around and asked them why we should switch," said a user at a large banking firm who requested anonymity.

"Modular PCs are somewhat attractive, but users also become locked into a vendor's PC line because you can only buy the upgrade from them," added Peter Kastner, an analyst at the Aberdeen Group, a market research firm in Boston.

INNOVATION DATA PROCESSING

Announce

DEC REORG

	ELAPSED	CPU	IO OPS
FDR REORG	0.64M	2.975	328
SYSLINKLIB	7.50M	60.515	20574
SAVINGS	91.5%	93.1%	98.4%

20

INNOVATION DATA PROCESSING

PC multiprocessing on horizon if AST rollout is any indication

BY MICHAEL FITZGERALD
CW STAFF

SANTA CRUZ, Calif. — When AST Research, Inc. showed off its latest server running The Santa Cruz Operation's (SCO) multiprocessing Unix last week, the infant personal computer multiprocessing business took another step forward.

Analysts pointed to this as another indication that microprocessor-based serv-

ers will soon be capable of truly replacing minicomputers and mainframes.

"This is a trend," said Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn. "Users are looking at PC boxes which have horsepower, reliability, scalability and security, and it's creating a tremendous demand in the marketplace for bringing mini and mainframe stuff down to this level."

Fiering cited high availability and better system security features and diagnos-

tic tools as important pieces of the large systems world missing on PC servers.

AST and the SCO marked the event as the first time the SCO's MPX 2.0, a multiprocessing version of Unix, had run on fully symmetric hardware. AST's system was designed so that processing tasks are distributed evenly among the available CPUs. True symmetric multiprocessing (SMP) would give a 100% boost in performance for each new processor. AST acknowledged that this performance is not achieved by AST's Manhattan SMP super-server.

The Manhattan SMP supports up to four Intel Corp. 50-MHz 1486DX microprocessors and 32G bytes of storage. Base price with one processor is \$26,995. AST said it has 12 beta-test machines,

mostly at software vendors, and will soon start a corporate beta-test program.

Michael Krueger, AST's director of advanced systems marketing, said AST will focus on signing up value-added resellers for Manhattan, which he said will ship in December. AST hopes to find 100 resellers for Manhattan and expects to sell "well over" 1,000 units in the first year.

Intel gets involved

Among several recent moves for the multiprocessing market was one from Intel, which last week confirmed that it is developing an Advanced Programmable Interrupt Controller architecture that will replace its current 8259A chip. Commands from the microprocessor to the rest of the PC get transferred through the interrupt controller.

Intel said changes in software and the development of more powerful chips is driving the architecture's development.

For end users in a stand-alone environment based on high-level processors such as the upcoming P3, performance gains will be anywhere from 5% on up, according to Jag Bolaria, an Intel engineer. For more significant gains will be made in a multiprocessing, multitasking environment, where every switched task means that the interrupt controller gets called into play.

"With the new operating systems, like OS/2, Windows NT and Unix, they're all multitasking, and there really is no interrupt controller for that," Bolaria said.

He said Intel will release a version of a new Advanced Programmable Interrupt Controller next month, but he said it could change several times before it appears in products.

Intecom ties LAN to phone switch

BY JOANIE M. WEKLER
CW STAFF

ALLEN, Texas — Former Wang Laboratories, Inc. subsidiary Intecom, Inc. has taken an innovative approach to survival in a long-saturated private branch exchange (PBX) market.

The vendor said it will announce today that it has integrated 10Base-T local-area networking, a Fiber Distributed Data Interface (FDDI) backbone, bridging, wiring hub capabilities and wide-area networking interfaces into its Integrated Business Exchange (IBX) PBX.

The goal is to turn the IBX telephone switch into an enterprise multimedia network backbone that can be managed collectively, said David C. Tucker, director of marketing. The enterprise voice/data/video network-in-a-box is managed by the Hewlett-Packard Co. OpenView product because "HP was the only vendor interested in ultimately managing traffic other than data," Tucker explained.

Intecom's InteLAN offering integrates a logical 100M bit/sec. FDDI backbone within the IBX and internally bridges the 10Base-T networks across it to boost performance, Tucker explained. The cost per port is \$250, plus about another \$100 per workstation for a 10Base-T adapter card. Users, then, pay a premium of approximately \$250 a port for 10Base-T networking with the added FDDI backbone functionality.

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

IBM, Sears blend networking strengths

Joint outsourcing venture Advantis could cement IBM's position in the domestic services market

BY ELISABETH HOWITT
AND NELL MARGOLIS
CM 10/27/92

SCHAUMBURG, IL—Can two less-than-successful value-added network players combine to make one dynamic network outsourcing company? That is what IBM is shooting for with its announcement last week of an agreement to align its network service with that of Sears, Roebuck and Co.

IBM Information Network (IN) and Sears Technology Services, Inc. will combine to offer everything from network transport and electronic-mail services to designing, implementing and operating a customer's network,

the companies said. Analysts said the market for such services is expected to reach \$7 billion by 1994.

Called Advantis, the venture of two initial customers, IBM and Sears, are expected to make up 53% of its estimated \$1 billion in first-year revenue, according to Boston-based research firm The Yankee Group.

Sears' nationwide network and 1,500-person staff of network experts will position IBM "much more strongly" both as a value-added network that connects companies to their suppliers and customers and as an outsourcer that can meld a customer's network operations into its own, said John Rogers, Euro-

pean director at consulting firm Ledgeway Systems. The question is whether the venture can attain unique advantages over such network outsourcing giants as Electronic Data Systems Corp. and AT&T, he added.

To be successful, Advantis also needs to extend its Systems Network Architecture (SNA) and its outsourcing outside the U.S., analysts said.

Sears, meanwhile, gets to gracefully exit the commercial network services business. By contributing Sears Communications Co., the retailer receives an estimated 20% to 25% stake in the joint venture.

Best of both worlds

IN users seemed to have no doubt about the advantages of working with Advantis.

Blue Cross/Blue Shield, which evaluated Sears Communications before choosing IN as its network provider last year, "hopes to get the best of both companies' combined strengths" from the merger, said Robert Schultz, a senior consultant at the company. Blue Cross also hopes to take advantage of special Sears services such as "data transfer products and maybe some different twists for E-mail," Schultz said.

This is tremendously exciting to us," added Jerry Brager, chief executive officer at Laurence Harbor, N.J.-based Physician's Computer Network, Inc. His firm, which is 25% owned by IBM and uses IN to route information among approximately 60,000 doctors' offices that subscribe to its medical networking services, will become an Advantis customer automatically.

Both users said they hoped to see some lower pricing from Adv-

antis as a result of the economies of scale offered by combining the Sears and IBM networks. However, The Yankee Group suggested that both Sears and

Bridge building

IBM hopes its partnership with Sears will allow it to leapfrog value-added network competitors

Percent of revenue • Total: \$1.99 billion

Sprint 24%
Infonet 8%
GEIS 16%
BT Global Network Services 26%
IIN 13%
AT&T EasyLink/Intel 8%
CompuServe 3%
Others 2%

Source: The Yankee Group

IBM have already taken advantage of any potential economies of scale in their networks. Syd Heaton, Advantis chairman and CEO, related to "speculate on price changes."

The following is a rundown of the venture's strengths and weaknesses:

Service offerings. The true business of Sears' network should make it a snap to integrate with IBM's SNA-centric information network.

On the other hand, there is still a thing as being too modular. Users and analysts expressed concern that Advantis' solid SNA-orientation may make it harder for the network service to meet its customers' burgeoning demand for high-speed, multiprotocol routing applications such as local-area network interconnection.

IBM is in the process of bringing into IIN — and thus into Advantis — certain key technologies it uses internally that

"lend themselves nicely to commercial offerings," Heaton said. Potential upcoming Advantis services include Integrated Services Digital Network, frame relay, multimedia and digital broadcast service, he added.

• **Covering the map.** The two firms' network infrastructures are complementary: Sears' network, originally built to reach



CM Chart: Michael Higgins

out to Sears' consumers, provides inexpensive local phone access from some 20,000 sites nationwide. IIN has local nodes in fewer cities but provides the greater throughput for customer sites with high-volume traffic.

A major Advantis disadvantage is its focus on the U.S. market. While Advantis may be able to communicate with overseas users via ties to IIN's overseas units, those groups are making their own decisions about whether to expand their network outsourcing offerings, Heaton said. This leaves IBM without a cohesive global network outsourcing strategy, while BT, Sprint Corp. and Infonet have all been aggressively expanding their global offerings.

Worse, while IIN grabbed 13.1% of the international value-added network market last year, most of its business was here. Overseas customers still perceive the service as overpriced, The Yankee Group said.

Let's make a \$1B deal

The IBM/Sears Advantis joint venture "will be a \$1 billion company — and a profitable one" from Day 1, executives at both companies declared. Here's what else it will be:

• An amalgam of IBM's Networking Systems Services Division, including the IIN, internal communications and Integrated Systems Solution Corp. (ISSC) network support as well as Sears' information systems subsidiary, Sears Technology Services (STS).

• Jointly owned by ISSC and Sears, with ISSC holding a majority stake.

• Outsourcing vendor to Sears, including Sears business groups Coldwell Banker Real Estate Group, Allstate Insurance Co., and Dean Witter Financial Services Group, Inc.

• Network service provider to all current IIN and STS customers, with consequent access from some 550 cities in 92 countries.

• Staffed by some 3,000 employees: all of STS' current 1,500 plus some 1,500 more from the various IBM networking units.

• Target markets will include ISSC's stated target industries, CEO Dennis M. Welch said. These include retail, state and local government, health care, insurance, manufacturing and transportation.

NELL MARGOLIS

CA to port management software to NetWare

BY MICHAEL DOSTERT
CM 10/27/92

NEW ORLEANS—Companies turning to distributed computing could eventually gain the same centralized control and automation of enterprise work procedures long afforded by the glass house if software under development at Computer Associates International, Inc. and Novell, Inc. comes to fruition.

Under a deal disclosed at CA's Systems Software Conference (SSC) held last week, CA will port its CA-Unicenter systems management software to NetWare servers. CA-Unicenter for

NetWare will enable users to manage data, resources and business procedures across computing platforms distributed via networks.

From a central CA-Unicenter for NetWare console, for instance, an information systems manager could program, via CA/Novell's OS/2 Presentation Manager interface, specific populations of servers across the network to back themselves up at a given time.

A year away

CA-Unicenter for NetWare will be available in 12 to 15 months for Novell's NetWare v3.11, ac-

cording to Kurt Seibert, vice president of strategic business division at CA. He said a version for the NetWare 4.0 operating system will appear "almost simultaneously."

Mary Welch, vice president of corporate planning at CA, said the companies are developing pricing models for a distributed computing environment based on models CA created with Hewlett-Packard Co. for CA-Unicenter for Unix.

Analysts said CA has a ready-made customer base for the Unicenter for NetWare product.

"CA is really tied into its customers. It sees them moving from mainframes to LANs, and it's determined to move with them," said Sean Schutt, a senior industry analyst for local-area networks at Computer Intelligence/Idocorp, a Santa Clara, Calif.-based research firm.

Schutt said that more than a third of the applications being developed in sites with mainframes are being developed for the LAN platform.

SSC attendees with mixed NetWare and mainframe environments were enthusiastic about the software's potential.

"We're a Unicenter for MVS customer, so we think it's wonderful," said Phyllis Pallacios, SSC chairman and a computer support specialist at Peoples Natural Gas in Omaha. Peoples is in the early stages of adding NetWare to its IBM mainframe and Application System/400 environments.

Regulating control

M. Nicholas Lovelace, IS review officer at Connecticut Mutual, said he can currently use a separate LAN administrator for each

of its 12 Novell NetWare v3.11 LANs, which serve 500 workstations across nationwide.

"Our main interest right now is to centralize control [of the LANs], and what CA is doing now [with Unicenter for NetWare] will allow us to do that," Lovelace said.

Officials at both vendor companies said there would be little overlap between CA-Unicenter for NetWare and Novell's own NetWare Management System (NMS). They explained that the CA/Novell product manages the business processes and data that run over the hardware/software network infrastructure, which is kept up and running by network management systems such as Novell's NMS.

Senior editor Janine M. Wexler and correspondent Thomas Hoffman contributed to this story.



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GSA Contract Number GS00K90AC85251-P502

Wrestling with dinosaur image



Programmer Welch took an AS/400 course after she was laid off in 1991 — and six months later, she had a new job

Continued from page 1

employees," Beaumont said. It was a steep fall for someone who had managed million-dollar budgets as IS manager at Codex Corp. and had then become an IS consultant before being laid off in 1990. By his reckoning, Beaumont failed to get an IS job because of his mainframe orientation, his lack of experience in certain industries and the perception that he was overqualified.

One more reason was fierce competition. IS layoffs caused by the consolidation of data centers, corporate mergers and bankruptcies have all conspired to produce a surplus of mainframe jockeys in the U.S. When an employer does post a mainframe job opening, the company becomes inundated with 300 to 500 resumes and can be extremely selective, IS personnel experts said (see story at right).

"This is the worst stretch of unemployment in the data processing field I've seen in 10 years," said Roger O'Connor, an expert at Edward Perlin Associates, Inc., a consultancy in New York.

MIS Network Associates, an organization dedicated to helping out-of-work IS professionals in the New York/New Jersey area find jobs, has 330 people on its roster and adds about 10 a week, according to meeting coordinator John Sampson. "I'm betting that 80% to 90% have almost exclusively mainframe experience," he said.

The troubles in the mainframe job market will only worsen as companies pursue technology downsizing strategies. Peter Barria, an analyst at International Data Corp. in Framingham, Mass., said that more than 40%

of the large IBM mainframe shops reported that they are pursuing some form of downsizing, either moving current mainframe programs to smaller, distributed systems or focusing new applications development on those smaller systems.

No one argues that mainframe jobs will completely vanish anytime soon, given that there are roughly 24,000 mainframe computers in the U.S. that need care and feeding for the foreseeable future (CW, Aug. 17).

"There's still a substantial body of work for the mainframe folks, but it's just not expanding. All of the growth is in the PC and midrange areas," said Carol L. Covin, author of IS job-hunting guides for the Washington, D.C.,

and New England areas.

Once senior mainframe experts are laid off, it is especially hard for them to get reemployed because they expect relatively high salaries and have trouble changing industries. "It's hard to make the switch from defense to health or from banking to energy," Covin said.

The ones who are successful getting reemployed are those with experience in relational database management systems or computer-aided software engineering, said Shirley Bascom, manager at the North Canton, Ohio, office of Computech, a division of Management Recruiters International, Inc.

Dinosaur skills

But programmers with skills limited to Cobol and CICS — in high demand just a few years ago — are in big trouble.

"These guys with just plain Cobol/CICS [skills] are dead in the water unless they've got exposure to a database such as DB2 or expertise in a certain software package. Cobol/CICS is just not enough anymore," said Jack Ferrara, a principal and IS recruiting specialist at The Career Doctors, Inc. in Bethlehem, Pa.

"The mainframe guys are becoming dinosaurs. We have not placed one of these guys in a year," Ferrara said.

One of those dinosaurs is 32-year-old David Williamson, who was a Cobol/CICS programmer at Sherwin-Williams Co. in Cleveland. He has been unemployed since June and is considering changing careers. "I fear that my skills are getting somewhat outdated," he said.

IS career experts said people in Williamson's position should

get some training in the hot technologies of the 1990s, including personal computer networks and midrange systems such as the IBM Application System/400, as well as C and Unix. That may mean two steps backward in terms of pay, but it will eventually produce 10 steps forward in terms of career, Ferrara said.

Susan Welch, 34, a programmer of large Honeywell, Inc. systems, did just that after she was laid off in March 1991. She took a course in AS/400 programming and six months later landed an entry-level AS/400 job at Pannor Services, Inc., a communications firm in Palmerton, Pa.

However, getting the right training is not always easy because "the schools aren't keeping up," Bascom said. For example, she said, "the two-year technical colleges are still turning out RPG II and Cobol people, who are not in demand. They need to produce RPG III people for the AS/400, and they need to produce C people for the new open systems environment."

Of course, savvy mainframe professionals are adding PC local-area network or midrange skills while they are employed to make themselves more attractive to both current and future employers.

Up by his bootstraps

Fred Conroy, who lives in East Hartford, Conn., is one mainframe veteran who packed up PC skills on his own — and that saved his career when he was laid off from the Pratt & Whitney division of United Technologies Corp. in 1989.

After nearly a year without work, Conroy said, he decided to try the training field and landed a job at Cigna Corp.'s IS training department in Hartford, where he teaches PC skills to Cigna em-

ployees, including mainframe programmers.

Conroy gives this career advice: "Try to jump onto a rising star — whatever technology is going to be in demand 12 months down the road."

But for former mainframeer Beaumont, that chance will never come. He died unexpectedly from a seizure Aug. 8.

Older staff: First to go?

Every Tuesday night at the Knights of Columbus hall in Ridgewood, N.J., a group of about 85 unemployed IS professionals meets to talk about which companies are hiring. They also discuss discrimination.

"We talk about the kind of people that get hired, and they're definitely not people over 40," said John Sampson, meeting coordinator for the group, known as MIS Network Associates.

Older employees — those with mostly mainframe experience and higher salaries — tend to be the first laid off and the last rehired, he said. "Discrimination based on age is pervasive," he said.

But other observers disagreed. One IS career expert said there may be isolated pockets of age discrimination in the IS field, but it is not widespread because talent is what really matters to employers.

Nevertheless, the IS field is beginning to see its first lawsuits alleging age discrimination. Earlier this year, 11 former IS employees of Eastman Kodak Co. claimed age discrimination in a legal dispute over their transfer to an outsourcing vendor.

In 1989, 24 laid-off workers in the Hartford, Conn., area — including several IS professionals — filed suit against Pratt & Whitney, alleging age discrimination.

"I felt very strongly there was age discrimination there, just looking at the cross-section of people who were let go," said 47-year-old Fred Conroy, who spent 23 years in IS at Pratt & Whitney and is a plaintiff in the suit.

The company said its layoffs were conducted in a fair and humane manner.

By the numbers

Downward spiral

The number of employed programmers in the U.S. dropped sharply in 1991



SOURCE: U.S. Bureau of Labor Statistics

Although there are no hard statistics on how many mainframe-oriented IS professionals have lost their jobs, circumstantial evidence suggests that the number is in the tens of thousands.

Economic pressures in banking, defense and other industries have closed data centers right and left and put many IS professionals out of work during the last three years (CW, June 1). For example:

- First Interstate Bancorp in Los Angeles cut its IS staff by 68%, from 2,128 to 680, as it consolidated 11 data centers into two.
- Fleet Financial Group, Inc. in Providence, R.I., has cut its back-office staff by more than 3,000 since 1988 as it eliminated redundant data centers inherited from acquisitions and mergers.

• Pan Am Corp. in New York laid off its IS staff of 500 before it went bankrupt and ceased operations last December.

According to the U.S. Bureau of Labor Statistics, the number of employed computer programmers fell by 48,000 last year because of the economic recession and corporate restructuring. It is not known how many of these programmers were in vendor or user organizations.

Another clue is that the number of IBM and plug-compatible mainframes in the U.S. has declined 12% since 1989, from 27,274 to 23,920, according to Computer Intelligence estimates.

During the same period, the number of data centers decreased 9%, from 16,631 to 15,114, from consolidations.

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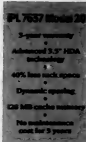
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NEWS SHORTS

Wang shuffles execs

Attrition and restructuring at bankrupt Wang Laboratories, Inc. has already begun. Ken Oliver, a 12-year Wang veteran, resigned late last week as Wang's head of Europe, Africa and Middle East operations but will stay on as an outside consultant. Joe Tucci, executive vice president of operations, will now oversee those offices from headquarters in Lowell, Mass.

Sematech to lose federal funds

Federal funding for the Sematech chip consortium will be phased out during the next five years, according to a report from the U.S. General Accounting Office. The announcement was made even though Sematech — with \$100 million a year from the U.S. Department of Defense and a like amount from member companies — is on schedule to demonstrate parity with the Japanese in the capability of semiconductor manufacturing equipment by year's end, according to the General Accounting Office.

High-performance advances

The White House Office of Science and Technology Policy announced last week both the creation of the National Coordination Office for High Performance Computing and Communications and the appointment of Dr. Donald Lindberg as its director. Lindberg will remain director of the National Laboratory of Medicine at the National Institutes of Health. The new office is to coordinate the administration's multiagency effort to build a 1 Gb/sec. National Research and Education Network and T1P0S/sec. supercomputers and to coordinate that effort with Congress and the public, the White House said.

NET adds frame relay

Network Equipment Technologies, Inc. last week added frame relay networking capabilities to its T1 and statistical multiplexers. Users will reportedly be able to initiate frame relay transmission at the desktop, ship it over low-speed links to the corporate backbone, then leverage high-speed T1 and T3 (45M b/sec.) links to ship the data to user destinations.

Bell Atlantic offers net integration

Bell Atlantic Corp. last week entered the network integration market with the formation of Bell Atlantic Network Integration. The business unit will provide planning and needs analysis, product integration and network implementation services through its existing network of 338 field service offices.

CA extends scheduler

In addition to its alliance with Novell, Inc. (see story page 10), Computer Associates International, Inc. last week unveiled plans for several new systems-related products. CA-7 for AS/400, an automated scheduling system for IBM's Application System/400 minicomputers, extends production control automation across multiprocessor environments, including IBM mainframes. It costs \$15,000. CA-RSPV is a \$6,000 program reporting facility for IBM MVS operating systems that utilizes VTDC and several system catalogs. CA-Examining/PC is a personal computer-based auditing tool for identifying an organization's PC hardware and software inventory. Volume pricing varies from \$8.50 to \$22 with a minimum of 25 licensed PCs.

Short takes

As expected, Banyan Systems, Inc. announced that it plans to offer Open Systems Interconnect (OSI) support as a series of software options for Vines for The Santa Cruz Operation's SCO Unix (CW, Aug. 17, p. 10). The U.S. Department of Transportation has extended its service contract with Unisys Corp. for an additional five years. The \$201 million pact calls for Unisys to provide information services, operations research and engineering support. Robert Fabbio, founder and former president of Tivoli Systems, Inc., has left the company to develop and market computing services and software to help corporations make the migration to open systems.

HP to revamp customer service

Answers small-user complaints that support suffered after shift to VARs

BY MARK HALPER
IN STAFF

NEW ORLEANS — Some small to midsize Hewlett-Packard Co. minicomputer users are up in arms, saying the quality of support has declined since HP switched to a value-added reseller (VAR)-oriented sales strategy last year.

This week, HP is expected to heed their call by disclosing a shift in its sales and support program at the Interex users group meeting here.

At issue is a change implemented by HP last December in which the vendor began funneling sales of less than \$100,000 through resellers rather than the company's direct-sales force.

Ironically, HP said the shift was intended to boost support to what HP calls its smaller "B" and "C" accounts. But, as HP's chief of sales for the Americas, Manuel Diaz, conceded last week, the best-laid plans of mice, men and computer vendors go astray.

"This kind of transition takes

longer than you think it will," Diaz said.

Diaz is expected to announce at the HP user conference a plan to form what he calls an integrated sales team that will combine resources from HP's direct-sales force, telephone sales support staff and VARs.

Diaz said HP will have the team in place by Nov. 1 in an effort to "remove some of the problems that the smaller accounts have been experiencing."

One of the consequences of the December change was that users by who were accustomed to visits by sales representatives were moved over to VAR and telephone support. The loss of face-to-face contact with their sales representatives left some users feeling unsupported.

"A lot of customers used to having a salesperson calling on them regularly are having to deal with a telemarketing person and are not very happy about that," said Jane Copeland, president of Austin, Texas-based software developer Holland House, Inc. and head of the advocacy com-

mittee for Interex.

Diaz said he would provide more details at the Interex conference of how the integrated sales team will work to address users' support needs.

Meanwhile, HP's support organization, called Worldwide Customer Support Operations, last week announced new programs that it said will enhance support across the entire user spectrum. The new program is intended to simplify service choices and to increase the number of personalized service options, the company said.

The program gives users several support options, including an assigned support team and HP response center. It also offers users specialized support in areas including multivendor networks, software and on-site licenses.

The program is an extension of the HP Premier Account Support program launched last May for users of the Corporate Business System, a high-end minicomputer that HP introduced at that time.

Hewlett-Packard aiming stations at office desktops

CONTINUED FROM PAGE 1

service and support cost just as heavily.

Today, with hardware prices dropping, applications multiplying and ease-of-use features proliferating, HP and other workstation vendors are increasingly hopeful about cracking the PC lock on commercial desktops.

The changing HP workstation strategy includes:

- Targeting new applications in specific markets such as telecommunications, retail, financial services and customer service, rather than warring efforts trying to dislodge Sun's installed base. Already counted among HP's telecommunications customers are GTE Telephone Operations, US West, BellSouth Corp. and Northern Telecom, Inc.

- Training the sales force to push the Series 700 workstations to two overlooked customer bases: users of HP 9000 Series 800 servers and HP LaserJet printers.

- Phasing out, during the next several months, its high-end servers in the Series 700 line. This will eliminate a confusing overlap with the low-end Series 800 servers.

- Increasing investment in third-party software suppliers, ease-of-use software and Unix system administration tools.

- Producing low-cost, high-volume workstations that surpass the power of Intel Corp. high-end personal computers and sell in the \$3,500 to \$5,000 range.

"HP is doing well on commercial desktops. I would rate them second to Sun, which is far and away the leader," said Thomas Kucharzy, president of Summit Strategies, Inc. in Boston.

In the battle against Sun, analysts and users said HP's advantages are its leading position in Unix multuser systems with the Series 800 and a thriving X Window System terminal business that is now 20% of its desktop volume.

The downside for all the workstation vendors is the minuscule market share — estimated at less than 1% — for Unix as a stand-alone desktop in the PC-dominated commercial world.

Still figures are hard to come by, but industry analysts predict that growth rates in the business/professional workstation market could exceed 50% annu-

ally during the next few years.

"We've had a very good experience with HP," said John Reisma, manager of treasury technologies at Royal Bank of Canada's trading room in Toronto. Still predominantly an IBM mainframe shop, the bank has a niche of 125 HP Series 300 and 400 workstations in Toronto.

"There were times earlier on when you could see they were an engineering company making a transition," Reisma said. "But today we hear from a lot of software vendors who are using the 700s as a development platform."

Several users said that while the Series 700's leading price/performance now gets HP in the door, it is often other factors such as hardware reliability and service and support that tip the scales in its favor.

At Citibank N.A.'s Treasury Risk Management Division in New York, for example, HP won a new account based on its well-reputed support capabilities and its application performance.

"On Wall Street in general, HP never had a real presence. I think that's starting to change a bit," said John Martino, vice president of software development at the Citibank division.



HP's Elchhorn: Seeing a lot more sales and more long-term projects

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Users doubt a Wang comeback

Bankruptcy blues Dismissing Wang's predicament

Assets	\$1 billion
Debt	\$1.3 billion
Locations	5,000 worldwide, with 1,500 at headquarters
Recent stock price	38c
Timeline	Hearing scheduled for today to map out spending allowances for daily operations

Continued from page 1

terminals and personal computers for a series of local-area networks.

For users such as Chris Drumm, MIS director at a large Atlanta law firm, Wang's biggest mistake was overhyping Office 2000 — an 18-month-old, next-generation office automation strategy — before it was ready to flesh out the plan with products.

For example, an IBM RISC System/6000 version of Pace, Wang's database/software development system, still has not shipped, although the company has been promising it for several months. The product is due out before the end of 1992, according to Miller.

Still, Drumm said he is disillusioned. "They have good ideas, but they're unresponsive to customer needs. They pay us lip service," he said.

Miller said he is "convinced" that Office 2000 is the right path. Office 2000 is a blueprint for redesigning and streamlining office work flow with imaging technology. The plan allows users to keep VS machines while incorporating Wang Integrated Imaging System and RS/6000 boxes into administrative offices.

The impending court-monitored restructuring will let Wang focus development resources "to make sure these products are available to market over the next six months," Miller said.

Challenges: Keeping customers

Keeping its estimated installed base of 19,000 sites alive in the process is a twofold prospect: Wang must assure users about continued support of the VS line and provide a well-articulated path away from the VS to RS/6000 boxes, which Wang is reselling, users agreed.

While developers scramble to deliver on Unix promises, VS users should see no disruption in service or support of proprietary hardware, even while Wang lays off 38% of its 13,000-member work force, Miller promised.

Even so, many longtime VS shops are clearly exploring alternatives. Come September, Ted Hutton, systems manager for the Port of Seattle, will work with an outside consultant to lay down a future hardware plan.

"We don't have the budget to make a wholesale shift, but we'll go, sure and steady," he said, adding that LANs and as-yet undetermined Unix machines

Swimming in red ink

Wang's Chapter 11 filing makes it the largest computer company to claim bankruptcy

Revenue and asset figures at time of filing					
	Wang Laboratories, Inc.	Storage Technology Corp.	Memorex Telex Corp.	Alliant Computer Systems	Floating Point Systems, Inc.
Filing date	8/18/92	10/31/94	1/6/92	5/26/93	10/7/91
Revenue	\$1,900M	\$887M	\$714M	\$72M	\$47M
Total assets	\$1,418M	\$1,264M	\$1,643M	\$62M	\$62M
Status	Pending	Emerging	Emerging six weeks later	Pending	Pending

"The company is largely liquidated (assets still in process)"

Source: The Bankruptcy Database

will replace the port's 10 VS models.

American Express, whose migration from Wang minis to PC LANs is nearly complete, expects to save two-thirds on maintenance costs with its new configuration, according to Joe Caruso, director of corporate systems and technology. "We'll see complete payback on our onetime charges within one year," Caruso estimated.

Horror stories

Wang and its creditors do not want to hear such stories. Without maintenance fees garnered from existing users, Wang has precious little income to live on during its restructuring.

"In the 48 hours since Wang filed, our phones have been going crazy," said Michelle Gibson, vice president at ICA, Inc., an independent VS service provider in Atlanta. Gibson, a former Wang saleswoman, said she expects a "horrible attrition rate" of users who currently rely on Wang for VS support and will now turn to third parties.

Gibson estimated that Wang service brings in an average of \$600 million annually and said she "wouldn't be surprised if [Wang] lost \$100 million in maintenance contracts right off the bat, due to scared users."

It is unclear whether Wang will get a sorely needed \$75 million cash infusion

from IBM, related to the three-year, \$100 million reseller deal the two companies signed in June 1991. IBM invested \$25 million in Wang up front when it signed Wang on as an OEM for the RS/6000 and Application System/400 lines.

But both parties emphasized the deal's vague language last week. "There could be an additional investment of \$75 million," Miller said.

"It wasn't guaranteed but [was] based on [Wang's] meeting a certain level of sales performance," an IBM spokesman explained. That performance assessment is scheduled for January 1993, he added.

Neither party would enumerate precise sales objectives, but Wang has so far fallen short, according to industry watchers.

Wang officials testified during a September 1991 antitrust case brought against Wang by five resellers that as of June 1992 — a year after signing the IBM deal — Wang had sold just 18 AS/400s and 80 RS/6000s. One reseller estimated that since Open/Frame was unveiled in June, Wang has booked another 300 or so RS/6000s. Wang would not confirm the figures.

'IBM took Wang'

Edson de Castro, former chairman of rival minicomputer maker Data General Corp., echoed the general sentiment that Wang made a mistake agreeing to sell proprietary IBM minicomputers. "IBM took Wang for its installed base, and now what? The decision was positively naive," de Castro said.

"I think that if they emerge from

A HARD LANDING FOR A HIGHLIER

THE EARLY YEARS



1980
An Wang
born in China
on Feb. 7,
1920
Immigrated to
America.

1949
An Wang applies
for a patent for
core memories.
Years later, he
sells patent to
IBM for
\$400,000.

1951
Wang Laboratories
incorporated in
Boston on June
30. Its first pro-
duct, core memo-
ries, sells for \$4
apiece.

1959
Warner & Schoeny, a Cleveland
machine tool company, buys 25% of
Wang for \$50,000 in cash and a
\$100,000 loan.

1962
Wang Labs builds
Unisac, a test
justification machine,
for Comptonic in
Cambridge, Mass.

1963
Wang Labs
research
lets
\$427,000

1965
First Wang product — a
\$6,500 logarithmic
calculating instrument
called LOGI — hits the
market.

1966
Introduction of Model 300 calculator

THE BUILDUP

WANG

1967
Revenue climbs to
\$6.5 million.

1968
Wang introduces the
powerful and
fast 700
calculator, which
later becomes 70%
of its business.

1971
Wang introduces the L200, "a computer
with a brain." Orders strong from the
start, but pricing problems turn boom to
bust. About 80% of all L200s are
returned.



1972
First Wang
jokes company
as programmer
for a
minicomputer
that eventually
becomes the
VS.

1972
Company
wins first
contract to
install 40
VSs in one
year.

1973
Wang begins
delivery of the
\$8,000
VS-100-10
word
processor.

STEADY CLIMB

1974
The 2200 accounts for
50% of Wang revenue, but
Wang's debts rise to \$12
million to \$29 million.

1975
In September, Wang
start begins work on
entry-level, LAN-
like word processing
system (WPS).

1976
Another financial hiccup: Company is
more than \$50 million in debt, but
revenue is only twice that.

1977
VS mini, modeled after the IBM
360, announced in October for
commercial sales.

1978
Wang becomes largest worldwide supplier
of CRT-based word processors. Company
moves to Lowell, Mass.

1979
Wang reports
\$100
Revenue of
\$156 million

1979
Introduction of
Wang Integrated
Information System,
a combination of
Wang WPS and VS.

Chapter 11, they'll be a wholly different company," said Henry Creal, an information systems analyst for the city of San Jose, Calif. The new Wang will be much smaller, he said, or it may be bought out by another vendor. "Either way, Wang won't be Wang," Creal said. Miller agreed: "Our focus clearly

has to be on software and services," which is a line company officials have been repeating since the debut of Office 2000 in March 1991.

"If anyone can emerge successfully, Rick Miller can," said Matt Gillman, president of the U.S. Society of Wang Users, citing the \$575 million debt

Miller erased in his three years at the helm.

To survive, Wang must get products out — and fast, emphasized Tom Wilcott, vice president at the Aberdeen Group in Boston. "Wang's words have to ring true from now on, not hollow," he said.

As for the product lines...

While Chairman Rick Miller told *Computerworld* last week that he has "no plans to sell any part of the business," users and analysts speculated that some product lines stand to fare better than others after Wang's pending restructuring. Here are the consensus predictions:

• **VS line.** Continued incremental upgrades, with no new high-end machine to improve on the top-line VS 12000, introduced earlier this year.

Meanwhile, both Wang and IBM continued the party line, saying that their 14-month-old reseller deal is "intact, with business as usual," as Miller put it. Wang will provide coexistence and migration products that let VS users move to IBM's RISC System/6000, Miller said, adding that Application System/400s are still available from Wang, too.

• **Open/Space.** Wang demonstrated a Unix version of its database/application development system as early as September 1991 for The Santa Cruz Operation's SCO Unix. However, when Wang signed a reseller bargain with IBM in June 1991, the product was shelved, and Wang started work on Open/Space for IBM's RS/6000.

That version has yet to see the light of market, but it is due before year's end. Selected users have seen the product, and they predict a November debut, probably during the annual meeting of the U.S. Society of Wang Users in Boston.

• **PC business.** Opinion is split. Some analysts said that

considering Wang's "reasonable" success in the main merchandising channel, the firm will keep the PC unit going.

According to more critical observers, Wang has no chance in the cutthroat, low-margin PC market, where economies of scale determine who makes money. Miller's take: "We will always offer the latest in high-quality PCs. But we're attempting to reduce overall investment in manufacturing, so we may be working more closely with others" to produce PCs.

• **Imaging.** As the cornerstone of Wang's Office 2000 work-flow automation scheme, imaging development and marketing are not likely to be touched. Imaging is one of the few hopes Wang has, said Tom Wilcott, vice president at the Aberdeen Group in Boston.

Wang, which introduced its imaging package for the RS/6000 last month, is at least two months ahead of FileNet Corp. in bringing out imaging for Unix, Wilcott said. "But if they don't have that product shipping in volume by mid-September as promised, they can just hang it up as a company," he warned.

• **SIMM.** Wang spent 10 months in court fighting several Japanese manufacturers for patent infringement on single in-line memory modules (SIMM). Wang won the case in August 1991 and is entitled to royalties from companies such as NEC Corp. and Toshiba Corp. on products they sold containing SIMM technology.

KIM S. NASH

Will Wang pull through?

Consensus among Wang watchers is that the company will have a tough, if not impossible, time pulling up its bootstraps and trading away from the signs of Chapter 11.

Although Wang Chairman Rick Miller pledged continued support and enhancement for the VS line, the majority of users interviewed last week said they are jumping ship now and expect to be completely off VS within two years.

That means Wang has a limited time to tread water on maintenance revenue accrued from existing customers and hope that the reorganization will prove profitable, many observers noted.

Miller told *Computerworld* last week that he expects the bulk of the 5,000-person layoffs to be done within 30 days and the rest of the reorganization to be carried out "as quickly as possible."

Life may not be easy, though. Filing bankruptcy protection against creditors may repel potential new customers. Strong rumors circulating for several weeks before Wang actually filed prompted some worried VS users, such as the American Stock Exchange in New York, to step up contingency plans.

Three VS minicomputers link 300 users at the Amex, which has been migrating applications from the minicomputers to local-area networks during the past two years, said Paul Doughty, director of data processing services.

"The fact that [Wang] is in Chapter 11 may help accelerate funding," he added.

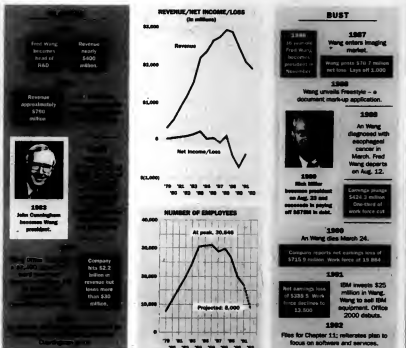
Besides customers if will, Wang must overcome other obstacles, according to Edson de Castro, former head of DG, including:

• **The grueling Chapter 11 process.** "The horrendous legal and accounting issues they have to deal with now will take their focus away from where it should be: products," de Castro said.

• **Clarifying Office 2000.** The 18 months since Wang outlined its office automation strategy does not appear to have been enough time for Wang to clearly explain Office 2000.

Overall, analysts were not optimistic about Wang's chances for survival. "I think...we're up against one of the most serious turnaround challenges in the history of the computer industry. It would take a Herculean effort," said Mary Rhodes, director of intelligent document management at New Science Associates, Inc., a Southport, Conn., market research firm.

KIM S. NASH
and THOMAS HOFFMAN





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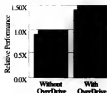
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intel.

Fed users to get ATM service from Sprint

Upgrade in network bandwidth will aid scientific research from genetics to global warming

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. Department of Energy and NASA last week selected Sprint Corp. to upgrade three national research networks to Asynchronous Transfer Mode (ATM) broadband service.

The huge boost in bandwidth for those networks will significantly speed progress in meeting the so-called "grand challenges" in science, such as global climate

modeling and human genetic research, users at the agencies said.

ATM, which moves data in fixed-length "cells," is an emerging technology that will allow data networks to evolve from T1 (1.5M bit/sec.) speeds to as much as 622M bit/sec., the agencies said.

T1 can transmit 20 pages of a standard dictionary in one second, while ATM can move up to 8,000 pages per second.

The T1 networks to be upgraded are the DOE's Energy Sciences Network and NASA's Aeronautics and Science Internet.

Joining Sprint in the \$50 million, five-year effort are TRW, Inc., which is providing 11 ATM switches; Digital Equipment Corp. for network management hardware and software and systems integration services; and Cisco Systems, Inc. for network routers.

Sprint said it is rolling out ATM for the DOE and NASA on an "early availability basis," beginning later this year. Commercial availability is not expected until 1994.

"We'd expect to have to build the

backbone and then find customers," said Dale Williams, an assistant vice president at Sprint's Government Systems Division. "Now we have the customer, and we have to go build the network."

Wave of the future

This upgrade may show a path for the way the communications industry wishes to go," said David Nelson, director of scientific computing at the DOE. "We as users, as early buyers, are hopefully accelerating the process but not off toward left field."

Nelson said ATM will allow transfer of large files — "gigabytes heading toward terabytes" — from one research site to another.

He added that it will also enable "video to the desktop" — moving as "packets" data — allowing researchers to collaborate face-to-face without traveling.

Nelson said the ability to move data at 622M bit/sec. will also enable "metacom-

THIS UPGRADE may show a path for the way the communications industry wishes to go."

DAVID NELSON
DOE

puting" in which remote computers can be tightly coupled in real time for cooperative processing.

For example, Nelson said, a Cray Research, Inc. vector supercomputer at the University of California's Lawrence Livermore National Laboratory could share a computational challenge with a Thinking Machines Corp. massively parallel computer at Los Alamos National Laboratory in New Mexico, software permitting. Each computer would then do what it does best, he added.

The ATM network will provide a service to users of the three government networks and will be available to serve commercial users as well, Williams said. A test network is to connect Sprint to a DOE site by the end of the year; a "preproduction" network serving seven sites is to be in place by mid-1993; and a production network for 33 DOE and NASA sites will roll out beginning in mid-1993, according to Nelson.

The project is funded under the government's interagency High Performance Computer and Communications initiative, one component of which is to develop a gigabit/sec. National Research and Education Network.

The upgrade of the three research networks is one step in the evolution to the National Research and Education Network, Nelson said.



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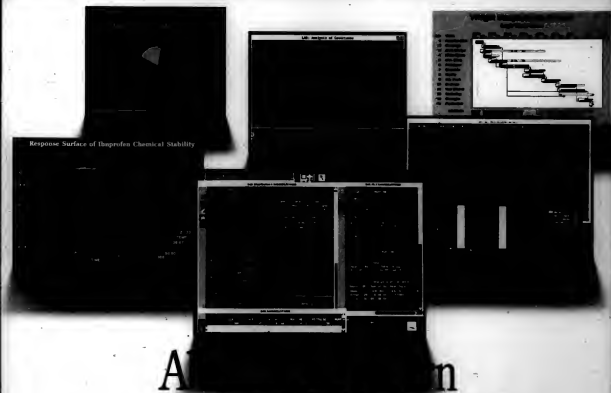
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Charles Dierker, Rolling Power 1930, Steel College Museum of Art, New Haven, Connecticut. Reprinted by permission of the artist. © 1990 IBM Corp.



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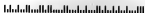
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ADVANCED TECHNOLOGY

TECH TALK

Tackling the big ones

• Solve this problem: How do you clean up groundwater pollution? Or this one: How can you make fuel burn more efficiently?

These are only some of the problems being attacked under six "grand challenge" projects funded by the U.S. Department of Energy. The projects are scheduled to receive a total funding of \$20 million, including cost-sharing by universities, states, corporations and foundations, during the next five years. Nine national laboratories, 16 universities and more than 40 businesses are planning to participate in the projects.

They fall under the following headings:

- **Computational chemistry**, which studies the impact of various pollutants and the use of natural enzymes to clean them up.
- **Structural biology**, with researchers developing software to study proteins and diseases.
- **Computational fluid and combustion dynamics**, with computer simulation of more efficient engines, incinerators and power plants.
- **Petroleum reservoir and groundwater modeling**, seeking to develop algorithms and computer codes for modeling petroleum and water flow through porous geologic formations.
- **Numerical tokamak**, in which computer simulations will be used in an effort to reduce the development costs of fusion reactors.
- **High-energy physics**, with massively parallel computers being used to determine the basic properties of matter at the subnuclear level.

Reaching agreement

• **Mitsubishi Corp.** in Tokyo and **Verdex Voice Systems, Inc.** in Edison, N.J., said they have developed a computer that recognizes continuous Japanese speech. The Japanese Voicestation, demonstrated last month in Tokyo, is intended to help users converse with and control computer-based systems with a natural and accurate interface.

Users: 'We want our data faster!'

Project targets goal of making storage devices capable of accessing data more quickly

BY JOHANNA AMBROSIO

CHICAGO

Break the bottleneck is the battle cry of a group of users and vendors working on the next generation of storage technology. The goal is to vastly increase the speed at which people can access their data by up to 50 times over today's systems.

Although the project is initially targeted at the scientific and technical world, some advances are expected to make their way into the commercial arena within five years.

The collaboration is called the National Storage Laboratory and is

that can take four hours or even longer to move from the supercomputer on which the data resides to the workstations being used by the scientists.

"The idea is gigabytes of storage at gigabit rates," said Don Oliver, vice president of business development at Zitel.

The bottleneck today occurs because of the way data moves through the system, from a supercomputer through a file server and then into the workstation. The new architecture calls for data to be routed through a high-speed network or switch between the storage device and the workstation.

Today's storage systems can move 8 million to 16 million bits of information each second. The project's goal is to move 100 million to 400 million bits each second.

To accomplish this, the National

Storage Laboratory is working on such software that gives you the ability to manage multiple sites from one central control point, than what is commercially available today.

Another breakthrough will be needed in the area of storage hierarchies. In today's commercial systems, frequently used data is kept on disk, and less frequently used data is on tape. But if a new type of tape is added, it will require a new hierarchy: disk to new tape, old tape to new tape and so on. Today's storage systems cannot handle this level of complexity.

Years from market

Although three years is the time frame for the project to be completed, it may take longer for the technical advances to find their way into the commercial world. "It's a bit early," said James Porter, president of Disk/Trend, Inc. in Mountain View, Calif. "The requirements for numbers of transactions, transfer rates and capacity are atypical for most of the computer industry."

Traditional architecture



New high-performance storage architecture with high-speed data transfer



housed in the University of California Lawrence Livermore National Laboratory in Livermore, Calif.

The venture got under way formally in May, but hardware and software is still being delivered, and the bulk of the three-year project is scheduled to begin early next year, according to Richard Watson, the project coordinator at Livermore.

Multivendor push

Six vendors are providing software and hardware, including a 20G-byte disk array from IBM's Adstar storage company in San Jose, Calif.; a solid-state memory device from Zitel Corp. in Milpitas, Calif.; network switches and gateways from Network Systems Corp. in Minneapolis; and UniTree storage software from General Atomics' Discus Division in San Diego.

IBM's Federal Sector Division is the systems integrator, and Ampex Recording Systems Corp. is providing high-speed, high-capacity tape systems. Four National Science Foundation Supercomputer Centers, including those at the University of Illinois and the Pittsburgh center, are also planning to participate.

Indeed, the project's initial application will be three for the scientific world: climate modeling, magnetic fusion energy research and real-time editing of computer-generated movies.

The common theme is that these applications require very large data sets

tional Storage Laboratory will assemble existing commercial storage systems communicating over a high-speed network called High Performance Parallel Interface (HPI).

As a model, the group is using the architecture from the Storage Systems Standards Working Group of the International Electronics Engineers.

"There's very little new invention required here; it's just a matter of applying a new approach in terms of connectivity," said Bruce Henry, a senior architect at IBM Adstar.

In this model, the data storage device—whether it is disk or tape or optical—is attached directly to the network instead of to a server. A lower speed network is used to send messages requesting data; the high-speed network is used to send the actual data.

"Network-attached storage architecture is going to be a major emerging technology in the server world," Watson said. "This is not the first time it's been thought of—it's the first time all the pieces are there to make it work."

This will, however, require more advanced storage management software,

Still, he said, there may be "useful by-products" for the industrial sector in "improving the efficiency of some commercial systems."

Ken Hallam, a partner at ENDA Associates, a storage consulting firm in San Juan Capistrano, Calif., said, "The problem here is software. The new storage architecture says that where the data is stored—hard, track, sector—is independent of the actual device. But that's not how software is written today; you need to know all those things."

"If a commercial application had very large files and wanted to access them very rapidly, there's no reason why this model wouldn't apply," Henry said.

However, he added, that would require that commercial processors have a HPI channel in addition to ESD and other channel-attachment protocols used in many commercial environments today.

Apple announces a between Windo

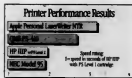
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The OneScanner for Windows.

EDITORIAL

Lessons



*For all sad words of tongue or pen,
the saddest are these: 'It
might have been!'*

—John Greenleaf Whittier

When business school professors wish to make a point about lost opportunity, they often refer to the railroad companies. Those companies mistakenly thought they were in the railroad business when, in fact, they were in the transportation business. That erroneous judgment left the railroaders standing at the roundhouse while trucking companies, and later the airlines, roared by them.

Thus was the case with Wang Labs, which last week found itself running for protection from its lenders under the shelter of Chapter 11. Perhaps more than any other founding computer company in history, Wang lost sight of its business. Therein lie the most poignant and wrenching lessons of the 1990s, not only for vendors but also—and maybe even more so—for the people who buy, deploy and manage information systems.

Understand that Wang was not just a case of another minicomputer company blown away in the PC revolution. This is a company that was an extraordinary technology innovator. Its founder invented mass storage. The company brought sophisticated desktop and palm-top calculators to the masses. It completely and irreversibly redefined the way work was done in the office. It was as though the company had stolen a page from the Bobby Kennedy school of thought: "I look at what could be and ask 'Why not?'"

So what happened? I recall a dinner meeting with two senior Wang officials three years ago, the week Chairman Rick Miller was brought aboard. I presented my guests with page after page of independent research that showed a Wang customer base growing year of slack service and support. I showed them other data, none of it new to them, that indicated the rapidly growing user penchant for open systems computing. Meanwhile, Wang had little in the works to respond to these and other crying needs from its own customer base.

Its response? "When you're growing your revenue and profits at 30% per year, it's hard to think you could be doing anything wrong."

In the end, no one really cared about Wang's pioneering innovations in office automation. Similarly, no one in today's world really cares about the accomplishments of IS professionals in solving yesterday's problems with yesterday's technology, no matter how well it was done.

In all the recently written analyses about Wang's demise, the word "unforgiving" pops up consistently. An unforgiving market. An unforgiving industry. An unforgiving global economy. It is an environment in which nice guys who build great companies cannot afford to forget that they are only as good as what they do today.

Bill Laberis

Bill Laberis, Editor in chief



LETTERS TO THE EDITOR

Sees benefits of Repository Manager

While some may feel that IBM's plans for Repository Manager/MVS were too grand, we believe its objectives serve information technology well: to provide an enterprise-wide, tool-enabled repository.

The major problem (and perhaps this is the real reason that you applaud IBM's move away from a host-based repository) could simply be that RM/MVS was out the right implementation of an enterprise-wide repository product. "Out like a lamb," CW, July 20.

This leads us to the biggest issue in IBM's repository rollout strategy. The initial release of RM/MVS was billed as a "vendor" release, which means that IBM did in fact recognize the need to gather a large support base.

Most vendors will agree that the initial software, although it was well-documented, was quite intimidating and that there was very little expertise available in the marketplace (or available directly from IBM) to leverage a vendor's efforts.

By building an all-encompassing information model before putting it to the test with integrated, repository-based tools, IBM has asked the information technology community to take too large a leap of faith.

Similar to its current efforts to surround OS/2 with applications and operation development tools, IBM needs to prove that repository-based development has real benefits.

Harry Brown and Lewis Stone
Brown/Stone Solutions

Is honesty the best policy?

This is regarding "IS cover-up charged in system kill" [CW, Aug. 10]. What really captured my interest is Max Hopper's observation: "Honesty is an imperative in our business."

On one hand, I'd like to see that phrase carved in marble and placed on the Intel of every data processing office in the world.

On the other hand, I know that honesty is one of the first casualties (along with quality) when a project becomes shaky.

Fortunately, rescussing honesty is fairly simple, and the "bean counters" will appreciate that it won't cost a dime.

All management would have

to do is stop shooting the messenger!

Certainly it would be nice if everyone were heroic enough to face the dangers of telling their superiors that a major problem has arisen.

However, it takes a hero, a novice or a fool to risk becoming the scapegoat when these things happen.

A novice will do it once; a hero will do it a second time; but as one grows older with more responsibilities and more to lose, being honest starts to look more and more quixotic.

William R. Roman
Chula Vista, Calif.

Relcom: E-mail Russian style

It's great to see coverage of the Russian computing scene, and I applaud John Morrison's efforts to publicize and exploit (in the very best sense) Russia's immense reservoir of programming talent ("Programming perestroika," CW, Aug. 3).

But I would like to put in a good word for Relcom, an electronic-mail network akin to our Internet.

Relcom is a highly successful E-mail network, with more than 60,000 users from a community of 500,000 to 1 million personal computer users overall—a very respectable proportion compared with the U.S.

Relcom offers regular E-mail as well as a variety of local and international information services. Part of its success, of course, is that the telephone system as a whole is so bad. You let your computer do your dialing overnight.

I find Relcom incredibly valuable in setting up appointments, sharing information and simply keeping in touch, as do many of my Russian friends.

Incidentally, much of Relcom's funding comes from the banking and exchange communities, which use it to exchange financial information.

Esther Dyson
New York, N.Y.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8891. MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

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Revising our technology policy

GORDON BELL



My bottom line for a better technology policy: Stop trying to centralize everything. Reduce government

control and spending and distribute the responsibility for technology to industry groups.

The Executive Branch needs goals, plans with payback and accountability — not policies that enlarge an out-of-control bureaucracy. One only has to look at the High Performance Computing and Communications Initiative to see how big bucks and concentrated power can induce brain damage and wreak havoc.

In the 1970s and '80s, the Institute of Advanced Research Projects Agency (DARPA) supported university research that formed products, companies and even industries. Now DARPA controls the supercomputer market with a massive development and procurement budget, creating more government-dependent companies while concentrating on massively parallel machines that may be minimally useful.

Ready for action

I have some suggestions for increasing technology research and reducing federal R&D spending that can be enacted immediately by the Executive Branch.

• Assign technology management responsibility to self-organized industry

groups with government partners. These industry groups will lead the planning in regulating technology leadership, including the formation of consortiums or laboratories. Their plans would be self-funding and include redirected government resources.

• Declare a moratorium on the production of reports and the formation of committees on technology and competitiveness. Review reports every year, provided they track progress toward their specified recommendations and goals. Limit

Cabinet and reorganize the Commerce Department so that people are responsible for industrial segments, not policies. Communication with industry would reduce blunders such as tariffs for the protection of dynamic random-access memory and LCD displays that accelerate offshore manufacturing.

• Murture new ventures in both start-ups and

or labs in ordinary venture funds, stimulating technology transfer from government laboratory to commercial exploitation via start-ups. Reward venture entrepreneurship at large and endangered companies through R&D tax credits that stimulate new ventures.

• Privatize federal labs and allow them to go into business. The World Bank has just completed a study showing that privatization does create wealth. Reduce the \$75 billion we spend on government R&D by requiring every lab to establish a business plan for privatization.

Immediately encourage labs to sell goods and services. Create external review boards to calibrate labs and aid transfer.

• Address manufacturing as our highest priority. Manufacturing engineers aren't even in the investment fund chain in the "research establishment" controls. This is an intellectual problem: Manufacturing is not considered academically respectable. The Japanese have it right. We have to change.

We also need to reward companies like Hewlett-Packard and IBM that are committed to manufacturing and discourage firms like Apple from becoming distributors for foreign products.

Output is the key, not budget control or policy. Anything any of these recommendations would move the U.S. in a positive direction, creating new models for growth.

Bell is a computer industry consultant at large, former head of R&D at Digital Equipment Corp., a member of various boards (including that of the Computer Museum) and winner of the 1991 National Medal of Technology.



Stephen Fischer

redundant reports and committees to two or three.

• Take responsibility for driving technology out of the military and into the hands of a stronger, reorganized Commerce Department. Give the secretary of commerce equal power on the

established companies. Invest government funds that would otherwise go to agencies

Give us alternatives!

I have a right to software that works. Shrink-wrapped software has allowed developers to sell bug-riddled software at no risk to themselves. Developers must be held responsible for correcting bugs.

I will not tolerate or support planned software obsolescence. We are tired of being asked to buy the same program every year. Vendors are earning unfair profits by forcing users to pay for the same functions in a new wrapper.

A user manifesto

I have a right to support services. Developers should guarantee access to support. Those who fail to meet minimum requirements should not receive our hard-earned dollars.

I have a right to interoperability. Software and hardware must work together. Developers and manufacturers must guarantee this or come under severe penalty.

I have a right to innovation. Where are the radical new

hardware platforms? Where are the bold new directions in software? How long will we be asked to keep buying the same thing over and over again? We fear the creation of a new IS department built around the microcomputer. Already the technology requires experts and specialists. What has happened to the new wave thinkers?

I have a right to choose. No one should dictate the needs of the individual PC user. Let each of us choose the best solution for our requirements.

I have a right to be heard. We are the users. We will choose who will survive or perish. We are the supreme court, the ultimate judges. And we will be heard. Not in local bulletin boards or user groups. Not in vendor-sponsored trade shows. The strength of our commitment will be a force that will be felt. We can change the world. Are you with me? Together, we can make a difference.

Golik is a consultant and trainer based in Montreal.

Users unite! Let's stand up for our basic rights

JERRY GOLICK



What happened to the revolution? Where have all the young turks gone?

In the bright early days of the personal computer movement, we were going to liberate ourselves from the mainframe. Computers were going to be placed in users' hands. Long delays in applications development would be a thing of the past. Well, 10 years have come and gone. Are we any better off?

Today's microcomputers are as complex as mainframes and require specialists to handle their care and feeding. Users are being forced to buy hardware and software they really don't want. Basically, we never got

any of that promised control.

It's time to assert our rights and throw off the yoke of computer complacency. We are tired of being asked to buy the same program every year. Vendors are earning unfair profits by forcing users to pay for the same functions in a new wrapper.

I, therefore, have taken it upon myself to write a new manifesto of end-user rights. It's just a start.

I have the right to intelligent interfaces. Users should not have to learn interfaces — interfaces should learn their users. Graphical user interfaces are not the end of interface research. In the meantime, the user should select the interface, not the developer.

I have the right to be mouse-free. Developers and manufacturers should not force the mouse down users' throats.

I have a right to software that works. Shrink-wrapped software has allowed developers to sell bug-riddled software at no risk to themselves. Developers must be held responsible for correcting bugs.

I will not tolerate or support planned software obsolescence. We are tired of being asked to buy the same program every year. Vendors are earning unfair profits by forcing users to pay for the same functions in a new wrapper.

I have a right to support services. Developers should guarantee access to support. Those who fail to meet minimum requirements should not receive our hard-earned dollars.

I have a right to interoperability. Software and hardware must work together. Developers and manufacturers must guarantee this or come under severe penalty.

I have a right to innovation. Where are the radical new

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White Paper

ENTERPRISE-WIDE
IMAGING

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WANG OFFICES THAT WORK

White Paper

Introduction

Image processing is a critical technology for many companies seeking a competitive edge, and enterprise-wide imaging is already playing a crucial role in some of the world's most successful companies. Despite its advantages, however, imaging has still not established a widespread presence in the U.S. business community. Even though it has gained more acceptance in foreign countries, it still has not fulfilled the hyperbolic claims made in its behalf.

Anemic economic conditions have certainly played a significant role in suppressing the growth of imaging. Although its potential is alluring, its price tag may be daunting. No promise of profits down the road can put nonexistent funds into capital budgets, and the future is now for businesses with their eyes locked on the bottom line.

Information Systems (IS) departments are among those hardest hit by the economic downturn. Frequently denied even the opportunity to have input on hardware and software buying decisions, they are unable to demonstrate the value they can add with imaging if given the chance. As a result, imaging and other new technologies such as reengineering, workflow software and groupware can languish unused.



Many of the negative aspects associated with imaging have been overcome. Networks and image compression schemes are now largely standardized. Further, the price per seat has dropped from \$100,000-plus in 1985 to \$20,000 in 1992. And the cost per transaction — a truer indication of cost — has dropped even more significantly.

Imaging will flourish when the business community realizes that it is time to reexamine its outdated mores and accept internal change. Imaging can then act as a complimentary technology within enlightened organizations.

This White Paper was written independently of the Computerworld editorial department by Scott McCready, Director, Image Systems with IDC.

For more information on the White Paper Program, please call 508-879-0700.





IS professionals at home and abroad are under siege. Budgets in many cases are flat if not declining, and the IS influence over IS-related expenditures has been showing a marked decline in recent years. Many companies are throwing around terms such as outsourcing, downsizing and reengineering, in many cases with little thought. Given these difficult times, it is not surprising that many IS professionals simply do not have the time or energy to cope with new technologies such as imaging, workflow software, groupware, et al.



"It's difficult to take a long-term strategic perspective on technology when the alligators are already in your swimming pool," is the way one IS manager describes his inability to plan for imaging. He is not alone. A worldwide study of 5,000 IS professionals conducted by IDC's Worldwide IT Customer Directions and Strategies Group shows that only 14.2% of IS professionals in the U.S. and 12.6% worldwide intend to implement any significant type of imaging capability in 1992.



Despite this modest forecast, cost-conscious user-company top management must understand that imaging, when combined with a more enlightened approach to business practices in

White Paper

general, can lift companies into a stronger competitive position. Effecting this kind of fundamental change in the traditional business psyche is difficult at best.

There are several arguments IS professionals give for not implementing imaging:

- Unless imaging can be implemented on an enterprise-wide basis it is difficult to justify the investment from a financial or architectural perspective
- Until imaging is available from system vendors, IS professionals cannot afford to invest significant resources
- On a cost-per-seat basis, imaging is simply too expensive
- Until there is a broad-based set of standards, imaging is too expensive to acquire, maintain and support
- Imaging is only good for specific departments and the onus is on them to interface with IS
- Imaging is flashy while microform technology is cheaper and legally acceptable.

Now that imaging is commonly based on standard networks, uses PCs without any specialized hardware boards, and is available from IBM, DEC, NCR and other leading vendors, the IS justification for not employing imaging on a broad-scale is eroding. Cost/seat prices have fallen from \$100,000/seat in 1985 to generally less than \$20,000/seat in 1992. Cost per transaction (a truer measure of cost) has fallen even more significantly over time.

The lack of specific ISO and de facto imaging standards is no longer a solid reason for not implementing image systems. There are CCITT Group 3 and 4 standards for compressing images, and many of the de facto standards used in the IS world — SNA, DECnet, etc. — are equally applicable to imaging.

IDC/Avante also believes the issue of imaging versus microform is moot. Microform is a valid tech-

nology for the long-term storage and retrieval of documents, and as such will be useful into the 21st century. Imaging is a less expensive way to process documents when they are in their active life cycle. Therefore, imaging and microform technology should be able to co-exist as part of a migration pattern in which active documents processed by imaging gradually become less active, or age to the point where it makes sense to store them on microform.

This is not to say that imaging is not effective in a file and retrieval mode, but retrieval rates have to be relatively high to justify the additional costs associated with imaging technology.

The primary remaining impediment to not implementing imaging concerns its applicability to a limited set of line-of-business activities. This is not a weakness but indeed a strength.

Imaging tends to yield the highest paybacks in industry-specific line-of-business activities. For example, insurance companies obtain optimal results by automating underwriting or claims processing functions. Banks typically benefit most from employing imaging in a mortgage loan servicing or credit card correspondence environment.

The challenge for IS is to find out which business problems respond best to imaging, and then implement imaging before the particular line of business installs its own maverick imaging system. In such a dynamic environment, the enterprise-wide IS architecture may be put at some risk. It is thus incumbent

upon IS departments to become knowledgeable about their companies' business operations at increasingly lower organizational levels.

Imaging and associated technologies such as workflow software and groupware can propel IS into a position of prominence.

THE ERODING IS POSITION

The trends of downsizing and outsourcing could not have happened at a worse possible time for IS professionals. Not only are they losing resources, but many IS shops are maintaining business applications that are 20 years old or older, and doing so without the promise of increased funds for support and maintenance. The problem is exacerbated because PCs and LAN purchases are eating into IS budgets dramatically. As the keeper of the enterprise-wide architecture, IS has been required to support an ever-divergent group of users requiring PC and LAN support, and demanding expensive departmental systems such as imaging.

Further, with desktop computers becoming as powerful as mainframes were 10 years ago, it is increasingly difficult to argue for a host-centric, central-control approach to automation. Client/server architectures are marching forth and the commodity pricing of computer power at the desktop and server levels shows no evidence of slowing. Therefore, the role of centralized IS departments will decrease as more and more companies refuse to write new mainframe applications, and more technologies such as imaging and OCR are put on networks. Add to this the pressure for open and standard systems, and it is easy to understand why IS is under siege.

On the bright side, the combination of PCs, LANs and existing network backbones creates the infrastructure IS requires to take its rightfully prominent place in corporate and organizational structures.



Although IS is increasingly gaining power in imaging system purchases, it is still left out of 60% of these critical transactions.

Enterprise-wide Imaging

TROUBLE IN THE BUSINESS WORLD

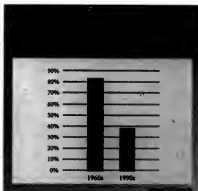
How many people have not heard the term reengineering? Not many. But how many really understand what it entails? The common perception of reengineering is that of gut-wrenching change in business systems and a whole new set of business applications that must be written or rewritten. The fact that business systems were not engineered in the first place hardly seems to matter to senior management hell-bent on reengineering their businesses. What does matter is that more and more businesses are recognizing the need to change.

There are several business factors that suggest that all is not well in the business world:

- The quest for Total Quality Management (TQM) is rapidly becoming a national obsession
- There is an increasing focus on the top-line (market share, revenue growth) as opposed to the bottom line (profit)
- Commodity pricing for PCs, LANs and servers means that the system vendors cannot afford to do business as usual. The major vendors face many of the same issues confronting IS
- Only through a continuous improvement program (CIP) can companies raise customer service levels and product quality while reducing costs and empowering employees.

IS ENTERPRISE-WIDE IMAGING REALISTIC?

Given the transformations taking place in the IS function, is it reasonable to expect IS to envision and implement an enterprise-wide imaging environment? Perhaps more to the point, does it make good business sense? There is a three-part answer to these questions. An economic response, an organizational or



Even though IS is slowly exerting more influence on imaging system purchases, it is losing its overall clout on major technology acquisitions.

logistical response, and a technical response.

Economically, it may make sense for some companies to employ imaging from an enterprise-wide perspective. The economic argument in some cases may be based on the ability to provide a new product or service that would not be possible without the use of image technology. However, for most companies the capital outlay for an enterprise-wide system must be spread over several years. Since most users must cost-justify the acquisition of image technology, this commonly limits imaging as an all-pervasive data type. Consequently, image technology has been limited to those areas where well-documented financial return was possible. Despite this trend, the shift from imaging in line-of-business applications to enterprise-wide use is slowly taking place.

Part of the reason for starting small may be attributed to simple economics, but certainly the limitations of the technology — most notably, its limitation to a single database domain — and the complexities of completing the necessary up-front analysis have also contributed significantly to the department-

tal adoption approach of image users.

Organizationally, the burdens of employing imaging technology on an enterprise-wide basis are formidable. In these lean fiscal times, the frequent senior management philosophy is, "If you are going to fail, make sure you fail small." That is why the first imaging project is often in the area of a company where failure has no price and success has little or no impact. These initial imaging projects are also frequently not transferable to other areas of the enterprise.

The organizational issues, more than the economic or technical considerations, pose the biggest obstacles to enterprise-wide imaging.

Technically, enterprise-wide imaging is possible. The challenge for vendors and users goes beyond connecting disparate computer architectures, employing standard and open systems. The challenge is separating those vendors with connectivity from those vendors that can layer an appropriate product set on top of the existing information processing infrastructure.

Most imaging users are automating the paper process. Since paper transactions cross not only LANs and wide-area networks (WANs) and in many cases countries, users need an architecture that not only allows transactions to flow freely but also can track and control transactions. This is where most enterprise-wide efforts begin to fall apart.

The other problem is that image systems tend to be bought and implemented in a helter-skelter fashion by various lines of business. Without some degree of IS coordination, many companies will rapidly acquire imaging systems from several vendors, thereby complicating the drive towards an enterprise-wide capability.

Enterprise-wide imaging involves

White Paper

more than simply integrating disparate computer architectures. It also requires access and customized views of the associated data and images. The definition of enterprise-wide access is not complex. Once a specific business function is automated with imaging technology, people beyond the newly automated department can also benefit from the imaging database. Therefore, it is necessary to find an economical method that provides casual access to this new database resource. This casual access should involve a consistent front-end that shields the user from the native interfaces.

Providing an enterprise-wide imaging system requires the use of sophisticated folder software, which allows users to view data and associated images for multiple management functions without storing the data and images multiple times.

Most of the system vendors, such as IBM and Digital Equipment, offer imaging based on their existing strategic architectures. For database management systems, this means Rdb and DB2. Networking is based on DECnet and SNA. The imaging system vendors are also catering to standards by supporting common databases, such as those available from Oracle and Sybase. XCOM and

"Without some degree of IS coordination, many companies will rapidly acquire imaging systems from several vendors, thereby complicating the drive towards an enterprise-wide capability."

Novell are the most prominent network operating system companies. Interactive multiwindow desktop interoperability is commonly offered through Dynamic Data Exchange (DDE) under MS Windows 3.0.

Currently, no single vendor offers true one-stop shopping. The system vendors are trying to address standards. When it comes to workflow software, they fail to understand it from an application and system-resource perspective. The image vendors are closing in on workflow soft-

ware application solutions, but they are not large enough to convince many large corporations to view them as significant automation suppliers.

THREE ORGANIZATIONAL MODELS

Enterprise-wide imaging systems generally reflect one of three organizational models. The first model is the traditional view. This model has a large number of workstations, is normally constructed with conscious architectural considerations, and is usually compliant with evolving standards such as those proposed by the ISO's Open Systems Interconnect model.

The second model of enterprise-wide architectures reflects the software changes IDC/Avante believes must happen if users are to widely implement imaging. These changes imply the use of folder software to present individual views of the data and images while only storing and manipulating one set.

The third model is based on the premise that the concept of the enterprise is expanding to include not only the user company, but its suppliers, agents, customers and government. All of these groups may be found in a single image implementation.

Today, many vendors and users alike

are stuck with the traditional model of enterprise-wide imaging. However, IDC/Avante sees a definite trend towards the second model, particularly in the insurance and healthcare industries. The third model is more applicable to truly innovative companies, mostly found in the financial sector.

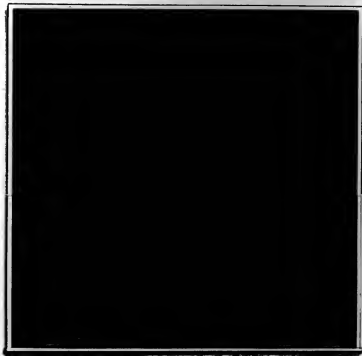
VENDOR APPROACHES

Sigma Imaging Systems is one vendor that preaches the gospel of distributed processing and central records control. It strives to leverage its systems at all levels while offering the ability to expand systems incrementally without having to add gigabytes of storage or make other dramatic changes. Sigma has implemented a system at Empire Blue Cross/Blue Shield with these central concepts in mind. The system features 23 Kodak ImagerLink 9000 scanners, processes 100,000 documents/day, includes six jukeboxes at three sites: Albany, N.Y., New York City and Yorktown, N.Y.

The system automates multiple lines of business medicine, a dedicated state service center and claims processing. The single catalog of images and the various jukeboxes communicate over an SNA network that links all sites. Work-

Vendor	Workstations	Customer	Application
Sigma Imaging Systems	1,650	Empire BC/BS	Multiple
FileNet	175	Chemical Bank	Multiple
FileNet	200+	Phillips Petro	Accounting
IBM	<50	D. B. Kelly	Photo Inspection Records
IBM	1,500+	USAA	Claims Processing
IBM	1,000+	WCB of Ontario	Claims

There is still a limited number of enterprise-wide imaging systems.



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Enterprise-wide Imaging

The IS Call to Arms — 11 Steps to Change

Unless there is a general call to arms, IS will become a simple maintenance function with some network caretaker services provided by specialists. It will have no opportunity to add value or make critical decisions. The call to arms should include several elements. In order to fulfill them, IS professionals must:



1. Understand the business environments of their companies and determine the appropriate mix of technologies to accommodate those environments.

2. Fully leverage existing IS infrastructures.

3. Recognize that IBM and Digital will be the network providers of choice, while imaging, workflow software and groupware will more than likely come from companies such as Lotus, Plaxus, FileNet, Action Technologies, Wang and Computon.

4. Recognize that outmoded development environments must go. Hard coding imaging solutions simply recreates nightmarish support and maintenance scenarios. Instead, users should use automation efforts to ensure that the workflow process is isolated from the business application, and eventually from the data application. The goal is to change the workflow without negatively impacting other processes.

5. Beware of vendors offering a new lease on life through image-analog legacy applications. This may be a suitable migration strategy for some, but it may leave others in a technology purgatory between the old and new worlds.

6. Break down the communication gap between IS professionals and business people.

7. Be aggressive with major computer suppliers. IS must demand that the system vendors alone, or in partnership, provide the appropriate products and services needed to get IS out of their legacy environments.

8. Implement imaging with an enterprise-wide view in mind while being mindful of the changes enterprises are experiencing.

9. Understand that imaging and the issues associated with imaging are typical of the organizational and technological issues that IS will be confronted with in the next ten years.

10. Shift IS expenditures away from processing transactions and toward automating people and the relationships between them.

11. Recognize that we are in a unique point in automation history. The competitive battleground is not simply quality or the time required to get to market. Instead, the competitive battleground is based on creating value, which, in the words of Russell Redenbaugh, Chairman of Action Technologies, is "the new coin of the realm." As such, we are not so much automating the flow of paper or data. What we are really talking about is an overall automation environment that allows systems to allocate resources dynamically.

in-progress is distributed on OS/2-based systems, but the image catalog — which contains 22 million documents — is on an IBM ES/9000.

FileNet Corp. considers its implementation at Chemical Bank in New York City to be an enterprise-wide system. According to FileNet, the system currently includes two cities, five systems and nine applications. Its users share data and images in a variety of different ways. Application processing, charge-backs and customer service applications reside in one city while the users are in two cities. FileNet says the

system qualifies as an enterprise-wide system based upon its having data available to a distributed set of people or multiple applications that may be co-located or distributed.

Wang Laboratories believes there are few, if any, image systems that are truly enterprise-wide. In fact, Wang argues there may not even be a demand for enterprise-wide systems in which anyone working in an organization has access to all information. With the exception of small and focused enterprises such as resume access in a recruitment environment, Wang believes the need for every-

one to have access to all data is simply not required. Since there is a division of labor between departments, the company maintains that it is unlikely that one form of information has to be accessed by all groups.

Despite this position, however, Wang also believes it is very important for prospective imaging customers to consider the enterprise-wide imaging implications in their up-front analyses because it leads them into considering the possible impact of standards and the implications they may hold for future expanded imaging systems.



CHANGE...

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White Paper

Not surprisingly, IBM has done a lot of thinking about the issue of enterprise-wide systems. The company says enterprise-wide imaging has a lot more to do with the approach than with scale or scope of implementation. It cites a number of notable considerations, including the need for:

- Some element of work management
- An industrial-strength solution
- A conscious set of architectural elements.

THREE ENTERPRISE-WIDE SCENARIOS

IDC believes there are three possible scenarios for enterprise-wide imaging systems. While all three are different in definition they are certainly not mutually exclusive.

The first scenario includes hundreds of workstations as are found in implementations at USAA of Plano, Texas, and Putnam Investor Services of Quincy, Mass. These systems are absolute in scale, meaning the number of workstations they support can be expanded without limitation.

The second scenario is found in

small companies where imaging is pervasive across the entire business. D.R. Kelly, which uses imaging to eliminate insurance fraud in the automobile inspection process, is an excellent example of this approach, which typically calls for fewer than 50 workstations. However, the ratio of workstations to employees is nearly one-to-one. D.R. Kelly is all the more remarkable because imaging allowed it to create a business that was not feasible without imaging.

A third scenario of enterprise-wide imaging comes into play when companies redefine their definition of the enterprise. IBM implemented an internal imaging system to handle customs documentation (IBM was the first company allowed by U.S. customs to destroy the original paper documents). Subsequently, the system is being expanded to include the customs brokers that handle IBM shipments at the different ports of entry.

GLOBAL IMAGING IMPLICATIONS

IS managers in the U.S. are not alone in the struggle to place imaging, work-

flow software and groupware in perspective. As Europe marches toward a monetary union, many United Kingdom and European IS managers are also coming under intense pressure to provide a more seamless IS environment on an intercountry as well as an intracountry basis.

Despite the European unification efforts, however, it is a great mistake to perceive Europe as one market. The use and sophistication of imaging in various European countries is as varied as the business problems imaging solves in the U.S. For instance, Spain and Italy frequently implement file and retrieval applications, while Germany uses more workflow technology.

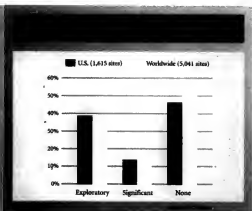
Far from being one market, Europe will remain a series of relatively unique markets well into the next century. Certainly the European Community (EC) simplifies many of the legal issues that U.S. companies must comply with in order to do business in Europe, but the driving factors behind the acquisition of new technology will still be different in each country.

As one European explained it, "We are all part of the EC but that does not mean we are similar or that we necessarily even like each other."

APPLICATION BRIEF The State of Missouri, Employment Securities

This agency's job is to collect quarterly employment taxes. This means that once a quarter Employment Securities is literally deluged with thousands of checks. The result is that its processing cycle has huge peaks that last for 10 days.

Before implementing imaging, it took 10 days to pull the checks and get them to the bank. Anyone that was available from another department was requisitioned to pull checks because the state wanted to reduce float and make sure it could tell people that their payments had been received. It took approximately six weeks to get the information off the reports and get the basic



Users are cautiously committing themselves to imaging systems.

Enterprise-wide Imaging

data into the agency's system. It then took another week to place the reports in numerical order. Eventually the reports were microfilmed, which took two more weeks.

The state's customer service representatives charged with replying to taxpayer inquiries did not have the necessary information until the end of the next quarter. Now, as soon as the check is pulled, the accompanying documents can be scanned and indexed. As a result, customer service has the information it needs within 48 hours of the check being pulled, and nine-to-ten weeks of waiting time is eliminated.

APPLICATION BRIEF

State Retirement Fund, Illinois

The State Retirement Fund was being forced out of its location, which was a problem because it had several million paper documents stored in cardboard boxes and on shelves. The fund had a finite number of dollars to spend, and had to decide whether to build special storage space into its next building or change its paper process. It opted for the latter, acquiring an image system in advance of the move to the new building. It used the system solely for converting paper to images. As a result, on moving day, everything moved but the paper records.

Industry	1992	1993	1994	1995
Banking	14%	17%	18%	20%
Insurance	7%	9%	11%	12%
Financial Services	6%	8%	9%	10%
Manufacturing	24%	23%	24%	24%
Transportation	5%	5%	6%	6%
Utilities	3%	3%	4%	4%
Government	21%	21%	20%	18%
Other	20%	12%	8%	6%

Leading Japanese imaging users in the manufacturing and government sectors frequently rely on electronic filing cabinet applications.

APPLICATION BRIEF

State of Louisiana, Department of Public Safety

The State of Louisiana Department of Public Safety needed to supply information on drivers to many other agencies and departments. Problem drivers are a large part of that information, and tend to remain that way over time as they go in and out of the court system, amass police driving records and have their licenses revoked. Insurance company requests further compounded the state's information retrieval demands. In this environment, the state typically provides information to six outside organizations. Since placing this information on an imaging system, all files are readily available, and can be easily shipped across communication lines. The state's goal is to leverage imaging to the point where it no longer needs paper and microfilm, but can maintain information in an electronic folder. It also wants to include arrest histories — which are

maintained separately from driving records — and mug shots in these electronic folders.

The state eventually wants this information to be accessible not only by the Department of Public Safety but by the court system and mobile units of the fire and police departments. The agency receives 12,000 pieces of documentation weekly, and has a 12-million-document backlog. So far, 2,000 terminals have been installed to fight the imaging battle.

APPLICATION BRIEF

American Republic Insurance Company

American Republic has \$386 million in assets, \$130 million in health premium income, \$1.4 billion in current life insurance business and 200,000 policy holders. It installed an imaging system in order to bring a higher level of automation to its claims adjustment department in the health claims area. Currently this area handles 1,300 claims per day, which is a 25% increase in volume over last year.

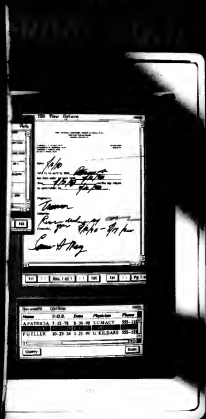
American Republic estimates that its image system will save \$1.25 million over the next five years on reduced staffing costs. An additional \$48,000 is expected to be saved in microfilm equipment and services.

File Edit View Options

Page 1 of 1 Word 6.0

The graph shows a function of x and y . The x-axis is labeled x and the y-axis is labeled y . The function is a jagged line with many small peaks and valleys, resembling a sawtooth pattern. The document has a menu bar with 'File', 'Edit', 'View', and 'Options'. The status bar at the bottom shows 'Page 1 of 1' and 'Word 6.0'.

A photograph of a computer monitor showing a document with handwritten notes. The document appears to be a form or a list of items. A red circle is drawn around a section of the document, and a red arrow points to it from the left. The handwritten notes are in black ink. The computer interface at the top shows a menu bar with options like 'File', 'Edit', 'View', 'Format', 'Tools', 'Window', and 'Help'. The bottom of the screen shows a taskbar with several open windows.



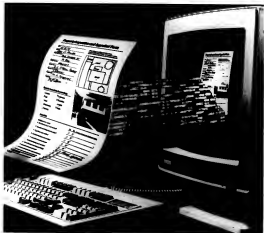
digital

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DESKTOP COMPUTING

PCs AND SOFTWARE • WORKSTATIONS

COMMENTARY

Paul Gillin

View from the West

Notes from a recent West Coast swing: Quattro Pro for Windows? If Borland's Quattro Pro for Windows is half as good as the demo I saw two weeks ago, this is a product worth waiting for. It is a lot more than a spreadsheet. It has true three-dimensional capabilities, a powerful graphics module and a database interface that should take full advantage of other Borland products waiting in the wings.

What is most impressive about Quattro Pro for Windows is its notebook metaphor. Picture your full year's worth of expense reports in a single 3-D volume with individual pages for each week. You can run all kinds of 3-D operations over these pages and move them around by just grabbing a tab and dragging. The notebook also lets you enter data into those annoying eight-character file names. Up to 256 pages can be combined in a single notebook.

Quattro Pro for Windows also embeds graphics within the spreadsheet and scales them so that they're readable in whatever space you have to work with. The graphics module is impressive. A right-button click gives you a menu of graphics options from anywhere within the graph, and you can scale and rotate 3-D graphs just about any way you want. You can even customize backdrops and individual bars to fill them with bit-mapped images for striking effect. The X-axis becomes the Y-axis with a single mouse click. And the menu buttons across the top—more than 150 of them—change to fit the mode you're working in.

The database desktop is a striking new concept. It lets you merge complex database queries with a spreadsheet front end, which cuts way down on screen development. You can even link bit-mapped graphics to database records and add options like a drag-and-drop operation.

Now here's the bad news. Borland has got problems. Quattro Pro for Windows

Continued on page 57

Move to GUI can put graphics to the test

BY CAROL HILDEBRAND
CW STAFF

With graphical user interfaces (GUI) currently hot out of the gates, many users looking to migrate to such operating environments as Windows or OS/2 are discovering that their hardware cannot pass muster. Not only is it a question of CPU, but a GUI also means a higher graphics hurdle to clear.

"GUIs are very hot, but there is a lot of demand put on the graphics by them," said Tom Ryan, executive director of the Video Electronics Standards Association (VESA).

Analysts said that users will want to consider the following display resolution and perfor-

mance requirements for wide-open Windows capabilities:

- With chip manufacturers coming out with random-access memory-digital analog converter processors, which provide higher quality color, users are going to need better displays. Many analysts also insist that larger monitors are in order. Jon Peddie, publisher of "The PC Graphics Report" in Oakland, Calif., said that for a corporate Windows user, a 17-in. monitor with Extended VGA (1,024 by 768 resolution) would be necessary.

• The next performance en-

High standards

Of the more than 15 display standards, the following are among the major ones that support Windows 640 x 480 resolution:

Name or category	Pixels	Lines
Video graphics adapter	640	480
Super VGA	800	600
Extended Graphics Array	1,024	768
High resolution or Extended VGA	1,024	768

CW Staff's Stephanie Tschoner

hancement is to use a graphics board that has bit block transfers (bitBLT). bitBLT takes the onus of moving things around on a screen off of the host processor and puts it on the graphics board, thus freeing the system from a time-consuming task. A similar enhancement is moving cursor support off of the host and onto the graphics board.

• Peddie also recommends having what he terms an input buffer, which allows the display board to take several instructions at once and hold them until the graphics board can process them, thus cutting down the use of the slow system bus.

• Another hot area right now is local-bus personal computers, in which the graphics board bypasses the system bus to speak directly to the host processor. With the chunky I/O bus out of the way, the speed increase is substantial.

The local-bus phenomenon has sparked a mired, with Epson America, Inc., Compaq Computer Corp. and Dell Computer Corp., among others, all coming out with proprietary versions of local-bus machines. This poses a problem to the board/chip manufacturers, International Data Corp. analyst Jon Carol Brigham said, as they have to jury-rig connections to each manufacturer's version.

However, VESA is set to ratify a features list for its local-bus standard by the end of the month. Ryan said, "The local bus really has potential. It will create killer PCs."

One interesting side effect of the advent of Windows is what is happening with graphics display standards. Graphics standards were critical in the DOS

world, Brigham noted, because application software had to have a driver written directly to the hardware in a standard way. IBM usually set the standard, with the likes of Color Graphics Adapter, Video Graphics Array (VGA) and Super VGA making appearances.

However, IBM's current entry, Extended Graphics Array, may end up as more of a controller than a standard. "With Windows, the interface takes over and you have a Windows driver," Brigham said, "It becomes less of a hardware standards issue and more of a Windows compatibility issue."

The bobbed of activity in the Windows arena has graphics board and chip manufacturers hustling to provide innovative products in a market that many analysts say is overcrowded. Thus, a user looking to exploit the full graphical advantages of Windows will find a buyer's market when it comes time to upgrade graphical capabilities.

Windows is having "a real positive impact on the user," Brigham said. "Board vendors face tremendous competition in terms of price/performance. There are a lot of products at very low prices," she said.

Peddie estimated that there are more than 400 boards on the market for VGA alone.

3M to ship 'floptical' disks

BY MICHAEL FITZGERALD
CW STAFF

ST. PAUL, Minn.—Imagine a floppy disk that could hold 14 times as much information as it can now, in the same form factor. 3M Co. is slated to begin shipping its new 20M-byte 3½-in. "floptical" disks later this month.

Users will be able to buy them through traditional retail channels. 3M has not set final pricing, but it said it is targeting them at \$31.45 a disk. 3M expects street

prices to be \$105 for a box of five.

Analysts interviewed last week were split on whether they thought flopticals, magnetic disks with optical discs in capacity, would become popular.

"It's a niche market," predicted Fara Yale, an analyst at Datateq, Inc. "It's a good idea, but the price of both the drive and the media will prevent it from becoming a product for the masses."

James Porter, president of

Continued on page 58

Wyse back to basics with upgradable CPUs

BY MICHAEL FITZGERALD
CW STAFF

SAN JOSE, Calif.—A pioneer builder of upgradable personal computers has returned to its roots while carrying out a revamp of its entire product line.

Wyse Technology, Inc. was one of the first vendors to sell upgradable PCs back in 1987, but it abandoned the business in 1990 because only 4% of its users had upgraded.

Recently, Wyse released the Decision 486SI family. The line uses a Wyse-designed local-bus video subsystem, called Hyper16 Video, and is easily upgradable, according to the company. Wyse also uses a switch-upgradable motherboard, so the user can simply flick a switch after installing a new processor, instead of having to upgrade the entire motherboard.

Get organized

Analysts said the new systems and their prices were sold additions to Wyse's product line, but the company must improve its distribution.

"Where they have only 20 to 40 direct VARs today, their goal is to have 200 to 300 direct VARs. I think that's a challenge for them," said Richard Zwetkowsky, an analyst at International Data Corp. in Framingham, Mass. Zwetkowsky pointed to the new products and a revamped field sales organization as major pieces of a strategy that, if executed properly, will

help Wyse stay afloat in the turbulent waters of the PC industry.

Pricing for the new systems ranges from \$1,729 for a 33-MHz Intel Core i486SX-based Decision 486SI-33DX to \$2,399 for one based on the 33/66-MHz 486DX2.

Wyse also released new models for each of its multiprocessor line server families. The 6000I Model 645, a uniprocessor machine, uses a 33-MHz 486, and it is slated to ship later this month at a cost of \$8,395. The 7000I Model 740MP supports up to three 33-MHz 486 chips and now has error detection and correction memory, remote diagnostic capabilities, improved connectivity and WY-9977 multinode communication interface boards.

Microsoft Corp. is using the 7000I 740MP for Windows New Technology development, and it has created a hardware abstraction layer for it. The base price for the 7000I is \$19,095.

The high-end Series 9000I 960MP can support up to eight 486DX2 50-MHz chips and 400 users. It is scheduled to ship this month at a cost of \$9,895.

At least one Wyse value-added reseller (VAR) was pleased with the announcements.

"I don't know of any other vendor whose product line is as wide as theirs in System Unit V," said David Robinson, president of Digital Systems Management, Inc. in Lakeland, Fla. Robinson also resells Digital Equipment Corp. equipment.

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Data Visualization



BOARD WATCH

Christopher Lindquist

Visions of Paradox



Summer is winding down, but the bulletin boards continue to buzz.

■ A Paradoxical situation. Everyone on Borland's BORDB forum

seemed anxious to jump the gun on Paradox announcements — except Borland. Paradox 4.0 is finally being shipped, according to the company. But at least one user on CompuServe claimed to have it a couple weeks ago, much to the surprise of the Borland support staff. After some good-humored sounding, the culprit admitted to his hoax, saying he was only trying to break the tension of the wait for the upgrade.

Other users reported that one hardware vendor was announcing shipment of PCs with Paradox 4.0 bundled well before the database was shipping, and in another vendor, Target Software in Allentown, Pa., posted a note about a third-party dialog box painter for 4.0. Now we'll see if the excitement is justified.

■ No ifs, ands or butts. A group of technical support folks on Usenet generally agreed that smoking and computers don't mix. "Machines don't like second-hand smoke any more than people do," quoth one. Their anecdotes sounded like medical reports: disk drives, keyboards and screens coated in tar, resulting in less reliable equipment.

■ That-ing one on. A response for when they say it can't be done: "It's one of those things where people say 'Even with a computer the size of the universe, it can't be solved in less time than it takes to count all the quarks in the universe, unless you buy the hackers more Jolt and Thai food than has existed in all history.'"

■ Parting advice. "If you want to be a hero, never buy Version 1.0 of anything. Pioneers are easily recognized by the arrows in their backs." And, "Low serial numbers are trouble. High serial numbers are trouble too, but more people can tell you their horror stories."

I'm on my way to Computerworld's California office, and it's good to know that while everything else will change, my E-mail addresses go on forever. Have any suggestions, tips or comments? Send them to me via CompuServe at 72362.2005, MCI Mail with 540-0464 or over the Internet to christ@unimind.netick.ma.us.

Linkpoint is a Computerworld staff writer.

HELP LINE

Ami Pro



Part of a continuing series of tips by PC software vendors, based on questions commonly asked of their customer support personnel. This week's tips focus on Lotus Development Corp.'s Ami Pro.

Q How can printing speed be increased?

A Choose Tools/User Setup/Options. Disable the "print in background" option by clicking off the X. Then turn off the Windows Print Manager in the printer section of the Windows Control Panel.

Q How can I move or copy text without using copy/paste?

A Select text, position the mouse pointer or where you want to move text and hold CTRL + click the right mouse button. To copy text, hold CTRL + SHIFT + click the right mouse button.

Q How can I select (shade) all text in an Ami Pro document?

A Place the insertion point at the beginning of the file. Press CTRL + SHIFT + END.

Q How can I prevent the (shaded) word I'm looking up from disappearing when I use the Thesaurus icon?

A The word is not visible because there is a need to repaint the screen. Touch PgDn, PgUp; or to avoid this situation, choose Tools/Thesaurus.

Q How can Ami Pro be loaded with an option to create a new file or open an existing file rather than displaying an untitled document?

A Create a new file and just type: Function Opening() File Close() SendKeys ("Alt+F") End Function. Then save the file as an Ami Pro Macro, naming it: opening.SMM. Choose Tools/User Setup. Enable the Run Macros program and write in the file name. Press OK.



(Coming August 31, a new idea in network printers from Compaq.)



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SEE US AT INTEREX, BOOTH #129

Gillin

CONTINUED FROM PAGE 53

is about three months late, judging by the fuzzy release date Borland discussed last year, and it's freeing purchases. The company has managed to squeeze out a new release of Paradox for DOS, but it's stopped even talking about time frames for Paradox for Windows, which it first demo'd a year ago.

Borland's latest reorganization puts dBase IV into the programming languages group, where it'll be sold as a tool for professional programmers. That underestimates the upgrade potential of dBase's user base and makes it a second-class citizen to Paradox. To top it all off, Borland is physically split up among more than a dozen buildings all over Scotts Valley, Calif. Isolation dampens morale. Recommendation to Philippe Kahn: Hire yourself a professional manager. Your company is too big and diversified to be run like a bootstrap operation. The smart people at Borland need to concentrate on products, not reporting structures. A lot of people want Borland to do well, if only to counteract the Microsoft dreadnaught. But even a band of

took up a minuscule 28K bytes of disk space, including all the graphics.

What's neat about that is that a 28K-byte file is a snap to download from CompuServe or send out over the corporate E-mail system.

Imagine publishing your magazine, newsletter, product documentation, etc. and posting it on a bulletin board or shipping it on floppy disk. Adobe has even built some hypertext features into Carousol that let you skip around a document by clicking on headlines or icons.

Now, whether Adobe can actually sell Carousol in the quantities needed to assure success is another story. As a publisher, I hope it can.

Gillin is Computerworld's executive editor.

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Tax preparation meets CD-ROM

NEW YORK — Research Institute of America, Inc. and Computer Language Research, Inc. recently entered into an agreement to bring to market what the companies claimed is the first integrated compact disc/read-only memory (CD-ROM) software package for small to mid-size accounting firms.

Research Institute's electronic research product, OnPoint, will be integrated with EasyGo, a tax preparation package from Computer Language, to create EasyGo with OnPoint, a CD-ROM system that will run on Intel Corp. 80386- or 1486-based machines. EasyGo offers tax compliance, research, electronic tax

forms, planning and practice management, all on a 600M-byte disk.

Stephen T. Winn, president and chief executive officer at Computer Language, said EasyGo incorporates all types of tax forms for city, state and federal taxes.

EasyGo with OnPoint is priced starting at \$2,000 for four disks. Users will receive monthly updated disks to reflect changes in tax law, according to Louis Luccarelli, president and chief executive officer at Research Institute.

Winn said users who buy the disks before Oct. 15 are entitled to a free Toshiba America Information Systems, Inc. CD-ROM reader.

WHAT IS MOST impressive about Quattro Pro for Windows is its notebook metaphor. Picture your full year's worth of expense reports in a single 3-D volume with individual pages for each week.

barbarians needs organization.

WYSIWIS. The two big bugaboos of electronic publishing are that documents are too big to transfer over a network economically and that a pretty document created on one machine won't look good on another unless the user has exactly the same software installed.

Now, along comes Adobe Systems with an approach you could call "What You See is What I Sent." Its Carousol software, due out in early 1993, is the most exciting new technology I've seen this year. Interleaf has a similar product called WorldView (shipping now) that's named at the high-end publishing market, but I haven't seen that yet.

Carousol makes high-quality electronically published documents readable by anyone with an inexpensive software "viewer." And it's machine-independent. In a demonstration, Adobe took a desktop-published front page of *Computerworld*, converted it to Carousol format and transferred it freely between different computers — DOS, DOS/Windows, Macintosh and Next. It looked almost exactly the same on all of them.

Carousol uses whatever fonts it can find on the target machine to recreate a page as accurately as possible on the screen or printer. Where it can't find a font, it mimics it using an Adobe technology that keeps all the line spacing and letter widths intact. You hardly notice the difference.

Best of all, Carousol compresses files by about a factor of 50 compared with PostScript. The *Computerworld* page

JUST BECAUSE YOU
CAN'T BE ALL THINGS
TO ALL PEOPLE,
THERE'S NO REASON
WHY YOUR
PRINTER CAN'T BE.

(Coming August 31, a new idea in network printers from Compaq.)



Delrina readies Perform Pro Plus

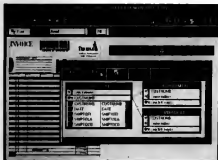
BY CHRISTOPHER LINDQUIST
CW STAFF

Toronto-based Delrina Technology, Inc. has taken a slightly different tack on building personal computer-based applications.

Companies such as Microsoft Corp. and Borland International, Inc. created development tools by attaching a form designer to a development environment with Visual Basic and ObjectVision, respectively. Delrina has come at it from the other direction. It has added a development language and other tools to its forms-creation package.

The result is Perform Pro Plus, a form-based tool that works on several levels to automate form processes.

At the first level, Perform Pro Plus allows users to create forms either by drawing them on-screen or scanning them in.



Delrina's Perform Pro Plus allows users to create forms either by drawing them on-screen or scanning them in.

The forms can then be printed as needed, which saves paper and form production costs. Secondly, these forms can be given "intelligence" that allows them to be filled in on-screen and perform such functions as calculations and data validation. The filled-in form is then printed.

Beyond this, the forms can be attached to various databases, such as Borland's Paradox or dBase, and used to automatically retrieve and update information. Finally, the forms can be attached to communications media such as electronic mail or integrated into other applications via Delrina's Intelligent Form Language to create dispersed, large-scale applications.

"The product looks quite stunning," said beta-test user Zai Zaver, an information analyst for the city of Calgary, Alberta. "It's a vast improvement over the old version."

In particular, Zaver said he was impressed with the enhanced user interface, which now offers button bars, and its increased support for external databases. "I think we'll be able to build far more sophisticated applications than before," he said.

Perform Pro Plus will be available this month for a list price of \$399. The Perform Communicator E-mail communications module and a server-based SQL product is scheduled to ship later this year.

IN BRIEF

Tandy ships 3800 HD

■ Tandy Corp. released the 3800 HD notebook, which uses the Cyrix Corp. Cx486SLC chip. The notebook, which actually measures 12.2 by 10 in., comes with 2M bytes of random-access memory and a 60M-byte hard drive, weighs 6 pounds, and has a battery life of two hours. Its list price is \$1,999; the company will distribute it in Radio Shack stores.

■ Texas Instruments, Inc. recently cut prices \$300 to \$800 across its entire line of TravelMate 3000 and 3000 WinSL products. A TravelMate 3000 with a 60M-byte hard drive now sells for \$2,499, down from \$2,799; TI's most expensive 386SLC-based notebook, with a 120M-byte drive, is \$3,199, down from \$3,999. TI also dropped prices between \$50 and \$550 on its MicroLaser printers.

■ SuperScript, Inc. announced that Kurta Corp. will collaborate with it on a pen-based desktop personal computer. Kurta makes cordless pen input devices; SuperScript makes pen peripherals.

Biles releases new version of AIM-Supervisor

Eases information sharing

BY MELINDA-CAROL BALLOU
CW STAFF

HOUSTON — Biles & Associates has released a version of its AIM-Supervisor process manufacturing software that was designed to allow users to share information across applications and platforms more easily.

The new version supports both Windows Corp.'s NetDDE and Digital Equipment Corp.'s At a Glance software on top of DEC's Application Control Architecture (ACA).

Irvine, Calif.-based Wunderware's NetDDE extends Microsoft Corp.'s Dynamic Data Exchange (DDE), which allows Windows applications to exchange data as if they were on the same computer. NetDDE lets users access information across disparate platforms and networking protocols that support DDE, Biles officials said.

Data automation

Using the NetDDE interface, for instance, engineers can set up a system to bring real-time process data from the factory floor into a Microsoft Windows-based spreadsheet automatically. Biles' AIM-Supervisor, which runs on VMS, collects the data and forwards it to the spreadsheet application. The communications to the personal computer are taken care of by NetDDE.

"A process or manufacturing engineer can dynamically update a spreadsheet with real-time and historical information, and once that information is in his database, he can manipulate it and do new calculations," said John Hook, national sales manager at Biles. "People have done this in the past but it hasn't been automatic — they've had to key it all in or do fast-file transfers. Now engineers can get the data automatically without having to know anything about the system and get on with the work that they know best."

With At a Glance, users can bring data from AIM to users on a range of platforms regardless of DDE support. At a Glance, which runs on top of DEC's ACA Services, lets users integrate PCs or workstations running VMS, Unix or MS-DOS. The two iterations of AIM offer varying advantages: The NetDDE interface offers AIM users easy access with their data to any of more than 1,100 DDE applications. The At a Glance interface requires a client/server implementation using ACA Services.

This means that users must write an ACA programming script for each client, but they can integrate data over operating systems that are not DDE-compliant, Biles officials said.

Support for the interfaces is shipping now in a prototype version, and each is priced at \$5,000. ACA Services and At a Glance must be purchased separately from DEC, but NetDDE is included. The AIM manufacturing system runs on VMS and Open VMS, and pricing starts at \$16,000.

3M to ship 'floptical' disks

CONTINUED FROM PAGE 53

Mountain View, Calif.-based Disk/Trend, Inc., disagreed.

"I expect there is a really good chance a market will develop for these," he said. "It works, it's reliable, and for a lot of folks, it's very handy to have on the computer, and it just might take off."

Performance on a premium
One beta-test user said the product is ideal for him so far, despite its expense.

"We use it tremendously," said John Stewart, host of "Radio Computer Magazine," a syndicated radio show.

The show runs for 30 minutes, and one minute of sound can consume 60 bytes of

storage space, which far outstrips the capacity of a conventional floppy disk.

Floptical technology is similar to the Bernoulli removable storage disks from Iomega Corp., but flopticals are smaller and cost less.

3M estimated that 10,000 floptical disks are now installed and that the base will rise to support a \$750 million business by 1995. The drives are made by In-Site Peripherals, Inc., which has licensed its technology to a number of vendors.

3M said larger personal computer programs such as OS/2 and Microsoft Corp.'s Windows 3.1, which consume many floppy disks, could be held on one disk now.

Re-writing your favorite spreadsheet applications makes about as much sense as re-inventing the wheel.

But that's how it feels if you are moving to Unix while your programs stay on the mainframe. We'll help you port your existing applications to Unix so, instead of wasting time re-writing them, you spend it writing new ones.

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NEW PRODUCTS

Software application packages

Comshare, Inc. has released Commander Version 3.0, an executive management support system.

Commander 3.0 has a personal computer-based graphical user interface. The Desktop Builder incorporated into Commander 3.0 is an application builder that includes a new scripting language and graphical script generator, according to the company.

Additional features include remote application management, information and application security and change control.

Commander 3.0 costs \$1,500 for a single copy. Volume discounts are available.

Comshare
3001 S. State St.
Ann Arbor, Mich. 48106
(313) 995-0398

Peripherals

The Information Systems Division of Mitsubishi Electronics America, Inc. has introduced Diamond Pro 17, a color monitor for personal computers, Apple Computer, Inc. Macintoshes and Unix-based systems.

The product was also designed for users who want a desktop monitor for Microsoft Corp.'s Windows and Open Look environments. It can be used for computer-aided design, manufacturing and engineering and for Unix users who are upgrading from monochrome monitors, according to the company.

Diamond Pro 17 can work with the Diamond Match Color Calibration System, which matches on-screen images with hard copy colors.

Diamond Pro 17 costs \$1,599.
Mitsubishi Electronics America
Information Systems Division
5665 Plaza Drive
Cypress, Calif. 90630
(714) 220-2500

Kanai Electric USA has started shipping the serial version of its Kwik-Stor series of user-expandable printer and plotter buffers.

With standard Apple Computer, Inc. Macintosh or IBM single in-line memory modules, the buffers can be expanded to a maximum of 8M bytes, the company reported. The baud rate can be set to allow the product to receive data from the serial port of the CPU.

Kwik-Stor can then transmit data to the printer. Support for both hardware and X-On/X-Off handshaking is provided.

Serial prices range from \$229 to \$1,029.

Kanai Electric
Suite 220
2005 Hamilton Ave.
San Jose, Calif. 95125
(408) 377-7062

SIG, Inc. has introduced Video Grabber Plus, a multimedia add-on board for AT computers.

Video Grabber Plus features video capture and live audio and video display. Images can be frozen and saved in an assortment of file formats ranging from 24-bit true color to 8 bits per pixel. The product is a video-card enhancement tool that has 21-bit color display support for 2 million colors simultaneously and color key-

ing of 256 colors.

Video Grabber Plus plugs into a standard 16-bit XT/AT expansion bus parallel to the Video Graphics Array (VGA) card. It connects to the VGA card via its feature connector, the company reported.

Video Grabber Plus costs \$495.

SIG
6078 Stewart Ave.
Fremont, Calif. 94538
(510) 657-6688

PC Guardian has announced NoteGuardian, a hardware product designed to prevent theft of portable computers.

According to the company, NoteGuardian includes a custom design anchor with

a built-in lock and a five-foot security cable. For portability, the cable folds into a compact carrying bag. The cable anchor is installed using existing features on the notebook.

PC Guardian costs \$49.95.

PC Guardian
118 Alto St.
San Rafael, Calif. 94901
(415) 459-0190

Fax

Brooktrout Technology, Inc. has introduced the TR114, a universal port card that fits into an XT/AT-compatible bus slot.

The TR114 has a dedicated CPU and a digital signal processor on each channel

for advanced fax and voice handling and format and compression conversion.

According to the company, the TR114 expands to include eight channels in a single XT/AT-compatible bus slot by using an optional four-channel daughtercard. The four-channel card includes four loop-start telephone interfaces.

TR114 supports Group 3 and 4 fax compression with automatic conversion of ASCII, Tag Image File Format and other files, which allows for binary transfer and eliminates the need for external data modems.

The TR114 costs \$2,995.
Brooktrout Technology
144 Gould St.
Needham, Mass. 02192
(617) 449-6100

COMING SOON: THE
MOST COMPLETE
NETWORK PRINTERS EVER
BUILT. AND YES,
YOU CAN PRINT THAT.



(Coming August 31, a new idea in network printers from Compaq.)



Norton Desktop for Windows: Great value

Technology Analysis—A roundup of expert opinions about new products. Summaries written by product research coordinator Derek Slater.

The second incarnation of Symantec Corp.'s Norton Desktop for Windows is greatly improved, reviewers said. The product provides a smoothly integrated file management shell for Microsoft Corp.'s Windows environment, and Version 2.0 is much faster than the previous release.

Ease of use: The Desktop space is usually very crowded, which can intimidate novice users, aside from that minor complaint, reviewers said, the product is very intuitive.

Speed: Speed was the Achilles' heel of the first Norton Desktop, but the new version is considerably faster. The install program allows users to pick and choose their configuration to save disk space if needed.

File management: A customizable button bar gives instant access to common file operations. Reviewers said file management on the Desktop is icon-driven and very intuitive.

Utilities: Norton Desktop includes full-function versions of Norton Anti-Virus and Norton Backup. It also has a solid text-editing module.

Overall value: At \$149, Norton Desktop is an excellent value. It simplifies Windows file management and provides a good set of utilities as well.

Symantec's Norton Desktop for Windows 2.0

Reviews	Ease of use	Speed	File management	Utilities	Documentation	Overall value
PC World 9/8	Can't be improved	No speed downs	A+/-	Impressive extras	Complete, easy to read	Good value, and a money saver
InfoWorld 5/11/92	Not intimidating	Load time much quicker	Outshines Windows 3.1	Rich	Presented clearly	Excellent
PC Magazine 8/24/92	NC	Decompressible faster	Improved file sharing	Editor's best improvement	NC	More useful, less attractive
PC Week 6/6/92	Easy to configure	NC	Drag and drop	Includes Norton Anti-Virus	NC	More complete and useful
PC Computing 5/92	NC	Improved	Great	Additional modules	NC	Excellent value
Users						
Robert Cameron, A large accounting firm						Makes Windows much easier
Tom Miller, Thomson Corporation, Inc.						Customizable interface
Brian Rodenh, Redtek Computer Services						Good added features
Analysts						
Mike Depp, Corporate Computer						More for standard than going exotic

Key: ■ Very good ■ Good ■ Fair ■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Symantec reported profits of \$7.7 million on revenue of \$62 million for the quarter ended March 31. Profits for the same quarter in 1991 were \$5.7 million on revenue of \$41.5 million. Analyst Peter Rogers at Robertson, Stephens & Co. rated the firm's short-term performance and long-term stability as very good.

Symantec responds

Bill Whipple, product leader of technical support:

Ease of use: For the most part, it's fairly easy to remove icons from the desktop. You can also have it automatically map everything onto a grid.

File management: Norton Desktop for DOS has compression technology. Under Windows, we haven't really received that much demand for it, but it's something we may address in the future.

NewWave 4.0: Powerful but slow

Hewlett-Packard's NewWave 4.0

Reviews	Ease of use	Speed	File management	Utilities	Documentation	Overall value
PC World 9/8	Poorish installation	Sluggish	Difficult text verbiage	Crooks text editor	A jumble	Complicated theme
InfoWorld 5/11/92	Customizable	A bit slow	No DOS file management	Folder location objects	Well-organized	A bit steep for individuals
PC Magazine 8/24/92	Sharp conceptual, little curve	Long testing hard-core requirements	Files appear as objects	Impressive multimedia tools	NC	Requires profound change
Computer Shopper 6/92	Anything but intuitive	NC	Icon-oriented	Agent facility provides scheduling	NC	Clearly defined benefits
PC User 7/92	Overly complex	NC	Drag and drop	Editable macro language	NC	Seems out of fit
Users						
Peter Harmon, U.S. Fidelity and Guaranty Corp.						Effective training
Joe Geline, Insurance Data Processing, Inc.						Impressive
John Debra, Los Angeles Municipal Court						Shelter from DOS file management
Analysts						
Barbara O'Brien, DataPro Information Services Group						Good front end for office systems

Key: ■ Very good ■ Good ■ Fair ■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

HP reported revenue of approximately \$4 billion for the quarter just ended, an increase of 14.8% over the comparable quarter in 1991. Profits were flat at \$76 per share. According to William Milon Jr., an analyst at Brown Brothers Harriman, the company faces continued pressure on margins due to severe price competition.

Hewlett-Packard responds

Kevin Schofield, product marketing manager:

Ease of use: If you are strong technically with DOS, there is a certain amount of unlearning to do. Novice users who don't have those preconceptions may find it easier to pick up. But we know that many users are going to be technically savvy, and we continue to make it easier for them. We've made big strides in Version 4.0.

With Release 4.0, Hewlett-Packard Co. has repositioned NewWave as an object-oriented shell for Microsoft Corp.'s Windows environment. Reviewers found the new version to be very powerful and said learning NewWave's innovative interface requires a lot of time and effort.

Ease of use: NewWave shelters the user almost completely from standard Windows operations. Icons on the desktop represent tools or objects, rather than applications. Reviewers said the learning curve for this unique shell is very steep.

Speed: NewWave is fairly slow and resource-intensive, requiring about 8M bytes of hard disk space.

File management: Reviewers lauded the drag-and-drop file management capabilities.

Utilities: NewWave's utilities include a convenient finder for locating files and the Agent language for scheduling and automation of NewWave functions. The program does not provide utilities such as backup.

Overall value: The benefits of NewWave (\$149) are smooth, visual file management, document management for groups and automation of system functions. Experienced users can benefit from the complex Agent macro language, and networked users will gain from the document management features.

WORKGROUP COMPUTING

LANs • Servers • Software for Groups

Interface, flexibility sell user on Beyond Mail for Windows

BY ROSEMARY HAMILTON
CHICAGO

OVERLAND PARK, Kan. — North American Salt Co. recently picked Beyond Mail for Windows as its corporate electronic-mail package, and it will soon begin installing it across its enterprise.

The firm selected Beyond Mail, which is far from a mainstream product today, because its messaging functions were comparable to the top sellers, such as Lotus Development Corp.'s CCMail and Microsoft Corp.'s Mail, said Michael Borbely, manager of networking and microcomputing at North American Salt. But, more importantly, it has a superior user interface and allows users to create customized workgroup applications, Borbely said.

Beyond began shipment of its Windows package earlier this month. In addition to basic E-mail features, the software allows users to include applications on the Beyond Mail platform that use its rules and forms technology. Users can also create work-flow and routing applications that include automatic-mail functions.

North American Salt is a privately held company that owns several salt and chemical businesses. It had revenue of about \$600 million last year, Borbely said. Approximately 3,000 people work for the various North American Salt businesses.

"We came into this [E-mail selection] project with some

very short and simple, but important, needs," Borbely said. "Beyond Mail provides the basics, and then there is a rules-based engine that walks over the rest of them," he said, referring to competitors' offerings.

North American Salt is working on some test applications that Borbely said will allow his group to write applications that boost the work-flow process, which they could not do with other E-mail packages.

Future applications

Borbely's group plans to write a Beyond Mail application that will automate the financial reporting process, which currently calls for plant managers to submit Lotus 1-2-3 spreadsheets each quarter. The Beyond Mail application is intended to automate the spreadsheet routing and consolidation process. It will also include triggers that will alert plant managers to send their spreadsheet data via Beyond Mail to headquarters. A Beyond Mail application will compile the data, and the tool will then automatically route a summary report to managers.

For now, however, the focus is to provide E-mail training to users, many of whom have not used E-mail before, Borbely said. "We will start at the executive level and then let it rain down through the ranks," he added. "We are using up our needs now to take it enterprise-wide. Our initial implementation will be for no more than 1,000 users," he said.

Navy uses ESP to cut costs

New personnel system may become model for other federal agencies

BY GARY H. ANTHERS
CHICAGO

ARLINGTON, Va. — The federal government gets plenty of criticism for botched system development projects, but occasionally Uncle Sam hits a home run. A personnel system developed in-house by the U.S. Navy appears to be such a winner.

The Electronic System for Personnel (ESP) substitutes electrons for the 55 tons of paper that were previously used to find, hire, transfer and promote civilian Navy employees. In addition to cutting costs and boosting

bring the total number of users to 40,000.

The U.S. Department of Defense intends to use ESP as the foundation for a department-wide system in its corporate information management program. In addition, several civilian agencies are eyeing the system for their own use (see story page 64).

ESP automates basic personnel management paper flows — requests for personnel actions, position descriptions, job applications and approval forms.

Images of these forms move from a variety of Navy offices through dial-up connections to a local-area network at the Human Resource Office.

A classification module enables managers in the field to electronically select or cut and paste position descriptions from a central library of 150 standard Navy job descriptions. The system prompts the user for information and responds with guidelines to help the manager select the proper job series and pay grade.

Users can then transmit the description to the personnel office with an electronic rendering of a personnel action request form. If the requested action is to fill an open position, the office can return to the user a list of qualified applicants selected

ON SITE

U.S. Navy
Human Resource Office
Arlington, Va.

Challenge: To automate 35-year-old manual processes that generate 55 tons of paper annually.

Approach: Applications written in-house using FoxPro software from Fox Software move electronic forms over a Novell LAN linking 200 PCs. Smart cards for authentication will eliminate requirements for signatures on paper.

Results: \$500,000 investment has had one-year payback in labor savings, allowed office to cut clerical staff by 12 people and staff to evolve "from paper pushers to human resource analysts and consultants."

from the Navy's master personnel database in Oak Ridge, Tenn. ESP also allows managers to track the status of their requests as they move through the bureaucracy and provides reports containing various statistics related to personnel actions.

The original objectives for the system were the classic ones: to reduce manual effort, eliminate errors, speed processing and trim costs. But ESP has produced an important side benefit, according to Michael F. Marchese, director of the Human Resource Office.

"Now managers don't call us with questions like, 'Where is my request to hire a secretary?' They can dial in and find that out for themselves," he explained.

Continued on page 64



Marchese: "We act more as advisers."

productivity, ESP has fundamentally improved the relationship between the Navy's Human Resource Office here and the users it serves.

By the end of the year, ESP clones will be installed at four other Navy sites, which will

\$152 961 538 600

By the end of this week Computerworld readers will have spent over \$53 Billion on Information Technology this year — representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

People have always b together. Unfor computing enviro

The good news, however, is there's a solution. Lotus Notes® software. A breakthrough technology that's helping organizations overcome the technological roadblocks found in most mixed computing environments, which often stop good ideas from ever going anywhere.

You see, Lotus Notes is a flexible workgroup computing environment that signals a better way for end users to work together...while giving IT and MIS professionals a better way to more effectively leverage their company's existing hardware, software and network investments.

Let's face it. Many companies have spent fortunes on technology over the years and have begun to wonder just how well it's paid off. With Notes, the benefits are immediate. Companies can finally begin connecting people and ideas for more informed decisions. Regardless of group size, location or network configuration.

What's more, Notes is an extremely flexible environment that makes the development and

deployment of all kinds of custom applications a relatively quick and easy process. Some typical applications include lead tracking, product planning, brainstorming, account management, reference libraries, call reporting, quality management and more. There are small and large

How People Are Using Lotus Notes

<i>Strategic Planning</i>	<i>Project Management</i>
<i>Sales Management</i>	<i>Sales Presentations</i>
<i>Industry Newswire</i>	<i>Policy Handbook</i>
<i>Customer Service Tracking</i>	<i>Electronic Mail</i>
<i>Forms Routing</i>	<i>Financial Profiles</i>
<i>Quality Management</i>	<i>Telemarketing</i>
<i>Contract Library</i>	<i>Technical Support</i>
<i>Correspondence Tracking</i>	<i>Job Postings</i>
<i>User Group Discussions</i>	<i>Credit and Collections</i>

companies, in fact, that have bought Notes to solve a specific problem, only to discover that it answered other needs as well.

Lotus Notes runs on the most popular networks (Novell®, IBM®, Microsoft®, Banyan® and DEC®). And,

Lotus Notes is an innovative workgroup computing environment designed to increase

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een open to working rtunately, their onments haven't.



in Windows™ and OS/2®. Just as we've done with our 1-2-3® spreadsheet, we'll soon have Notes running on all major platforms, including Macintosh® and UNIX®. Again the objective is to provide users with a seamless way of working together whether they're in the office or on the road. No matter what platform they use.

There's even more good news. You can get started with Notes for less than \$500 per user. In fact, when companies looking into Notes realize how much they can improve their productivity without major expenditures of time and money, their decision becomes a whole lot easier.

So, if you're waiting for the light to turn green, why wait any longer? Just call us at **1-800-872-3387, ext. 6709**. We'll help you get things moving right away.

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call 1-800-828-0541.

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IN BRIEF

Faximum,
HP unite

■ **Hewlett-Packard Co.** and **Faximum Software, Inc.** will develop client/server fax software for Unix workstations, the two companies recently announced.

HP will provide client/server expertise and human-factors engineering, while Faximum will concentrate on building fax software in a server environment.

The two plan to build a Transmission Control Protocol/Internet Protocol network that runs under the Open Software Foundation's Motif and will support both PostScript and PCL printer languages.

■ **Lotus Development Corp.** recently announced more CC-Mail business. It announced that FWP Information Services, Sears Business Centers and Corporate Software, Inc. will standardize on its electronic-mail platform. The three together licensed 3,000 CC-Mail nodes.

■ **CE Software Holdings, Inc.**, which makes QuickMail, an electronic-mail package for the Apple Computer, Inc. Macintosh, said it will bundle On Technology, Inc.'s Meeting Maker group scheduler with QuickMail.

CW singing conversion blues

Switch to Unix-based publishing system gives staff rude awakening

BY MARYFRAN JOHNSON
OF STAFF

Fourth in a series of reports on Computerworld's own migration to a Unix-based client/server system.

"All stressed up and no to choke."

That slogan has been appearing on T-shirts in novelty stores this year, and *Computerworld* could probably use a case of them about now.

Overshadowing the normal stress of news deadline pressures are a host of troubles with our own \$850,000 "rightship" project, which is taking the publication from a proprietary to a Unix-based publishing system that runs on IBM hardware.

Staff members involved in the conversion effort have been struggling with overdue hardware shipments, inexplicable software bugs, networking snafus, troubles with backup printing facilities and, most recently, escalating pressure from top management.

"I don't think we knew what would be involved with this," said Bill Labeis, editor in chief of *Computerworld*. "No one tells you."

Fuel to the fire

Further complicating matters are some upcoming special projects that cannot be accompanied by *Atex, Inc.*'s new Workgroup Publishing System software is not up and running smoothly by mid-October.

"We are under an extremely tight, extremely aggressive ramp-up schedule," said Catherine Gagnon, chief copy editor and a primary candidate for one of those T-shirts.

The appearance two weeks ago of a mysterious system-crashing bug was all the more maddening for the information systems department and the eight-member copydesk. The

bug freezes the screen and forces a reboot of the system, losing any changes not stored and saved. No one has been able to determine if the problem is the fault of the *Atex* application or Microsoft Corp.'s Windows 3.1 graphical user interface.

"*Atex* said this would be a stable product," Labeis said. "But when you talk to users, they don't think it's stable. They're finding it extremely buggy."

The ultimate gain from all this pain, however, should be faster, more flexible production of the newspaper, Labeis noted. *Computerworld* currently runs a proprietary version of the *Atex* publishing system on aging PDF-11

minicomputers from Digital Equipment Corp.

The client/server system will be anchored by two IBM RISC System/6000 servers that will work in concert to run the *Atex* publishing software and to provide mirrored backup and redundancy.

Handling off the RS/6000 servers will be a network of 50 IBM Personal System/2s and personal computer clones on writers' and copyeditors' desks.

As one of the first sites to install *Atex*'s new Unix-based system, *Computerworld* has demanded and received a high level of attention from the vendor. Complaints about support last spring led to the assignment of a full-time *Atex* employee for the project.

Under the initial plan—which looks wistfully optimistic now that everything is months behind schedule—the *Computerworld* copydesk was to be 100% converted to the new publishing system this month.

Last week, the copydesk hit the 10-page production mark, and the goal is to roll out a half-dozen more pages each week through October. By January, all of the writers and editors should have joined the copydesk on the new system.

The first RS/6000 has been installed, and the second is due in early September. Any slipping delay for the RS/6000 could have serious consequences for that mid-October deadline. "At most everything from IBM has been two to four weeks late," said Linda Nelson, *Computerworld*'s IS director.

Another obstacle is the office politics version of "Too many cooks spoil the broth."

"We are completely re-engineering how we produce our pages, and that introduces the possibility that politics can get involved," Nelson said. She recently began distributing a detailed report on the project each Friday afternoon to a host of



CW's Gagnon: "We're under an extremely tight schedule."

managers from both the production and editorial sides of the company and to key vendors.

What about backup?

Another pragmatic concern is backup—in this case, a software problem at the backup facility for Perry Printing Corp. in Waterloo, Wis., the printer whose *Computerworld* ships its pages for final printing and distribution.

A few weeks ago, the image-setting machine at Perry went on the fritz, and a handful of pages being produced under the new system had to be duplicated on the old system.

The problem was resolved by arranging for additional backup image-setting facilities at two other printing companies in Madison, Wis.

Computerworld is also coping with staff shortages. The systems department, recently lost its No. 2 person, and the copydesk has been searching for another editor familiar with *Atex* software. Out of 300 resumes received, only one listed *Atex* experience.

Saber Menu
System debuts

Saber Software, Inc., a Dallas-based maker of local-area network menu and administration utilities, is shipping Version 2.0 of its Saber Menu System for Microsoft Corp. Windows.

The new icon-based version runs under Windows 3.0 and 3.1 and was designed to simplify LAN/Windows management and administration. It boasts an Inman utility, which gives LAN administrators networkwide control and automatic management of users' INI files.

For the user, Saber Menu System 2.0 provides a point-and-click icon front end with customizable screen views, personalized menus, security, screen blanking and network messaging. Saber Menu System is available in 1-, 10-, 25-, 100- and 250-user versions.

Navy uses
ESP

CONTINUED FROM PAGE 61

"Now we act more as advisers, as consultants. We're playing the role of human resource specialists, not paper pushers."

After two false starts plagued by poor contractor performance, the Human Resource Office decided to do the job itself. The result was a \$500,000 system coded in FoxPro from Fox Software, Inc. in Pittsburg, Ohio. It runs on a Novell, Inc. LAN that links 800 IBM-compatible personal computers to a server and supports 1.2G bytes of data storage.

The Navy is testing "smart cards"—waller-size cards with embedded microprocessors—for electronically signing documents and authenticating the signatures of thousands of Navy managers outside the personnel office.

Strong impression

The U.S. Navy's Human Resource Office at Crystal City in Arlington, Va., has demonstrated ESP to 42 defense and civilian agencies of the federal government, and a number of them seem inclined to implement the system. Having been generated by a government agency, the software is free.

The U.S. Department of Agriculture, which administers personnel systems for 460,000 employees at several agencies, said it is likely to add ESP to its automated operations as a sort of front end or user interface.

"What's attractive is that ESP begins with the manager, not the personnel office," said Brad Foote, acting director of the automated personnel division. He said most government personnel systems require managers to fill out paper forms and send them to a human resource office for data entry.

"The council has reviewed the ESP and we're impressed with it," said Philip Schneider, a member of the interagency Personnel Automation Council and assistant director of work force information at the Office of Personnel Management.

"We're encouraging agencies to look at ESP as one of several options that are quite good and fairly easy to adopt."

"It's orientation is toward line management," Schneider added. "It helps cement an operating relationship between management and the personnel office."

LAN-to-host product ships

Digital Communications Associates, Inc. (DCA) in Alpharetta, Ga., said it is adding support for TN 3270 over Novell, Inc.'s NetWare for IBM's Systems Architecture (SAA) and Transmission Control Protocol/Internet Protocol (TCP/IP) to its micro-to-mainframe connectivity products.

TN 3270 is industry-standard terminal emulation software that lets users to access IBM hosts without going through an IBM server. The new support will allow users of DCA's Irma

Workstation for DOS, Irma Workstation for Windows and Irma Workstation for Macintosh to access mainframes through non-DCA gateway products, such as NetWare for SAA or a TCP/IP interface network.

According to DCA, NetWare for SAA support will be included in its Irma Workstations for Windows, DOS and Macintosh near year's end. TN 3270 support will be included in the DOS and Windows Workstation products by the end of next year.

MICHELLE DOSTERT

PCs and voice recognition help co-op sell artwork

BY CAROL HILDEBRAND
CW Staff

Mixing computers and art has always raised some eyebrows, but many artists turning a thumbs-down on computer-generated works of art.

But nobody can argue with the idea of creating a network to help art dealers better sell art created by humans.

Joe Sigel, the founder and chief executive officer of the Art Research and Trading Cooperative (Art Co-op) in Santa Fe, N.M., has harnessed together four personal computers, voice recognition software and fax and modem boards to create an online clearinghouse that lets dealers buy and sell limited-edition serigraphs and the like without spending a day on the phone.

"What's most unique is that we have been able to merge database technology with voice response and fax technology," Sigel said.

Hybrid system

The system runs on networked 386- and 486-based PCs. Two 24-port PCs run the voice response system, which encompasses Ease call-processing software from Expert Systems in Atlanta and voice boards from Dialogic Corp. in Parsippany, N.J. The third machine houses the fax engine, which is also from Dialogic, while the fourth PC contains the database itself, which is FoxPro, Inc.'s product. Sigel said the setup is a mixture of DOS and Unix because the fax boards are Unix-based.

Sigel, who deals in the secondary art market, said he first came up with the idea for the system as a reaction to the time-consuming phone calls he had to make looking for a specific work of art. As the phone calls rippled outward, the price of a work of art also tended to go up, as one dealer after another tacked on a commission once the work was found.

With Art Co-op, a dealer dials into the system and punches in a personal identification number and a member number. Each work of art in the database — currently about 16,000 titles — has its own identifying number. Using the phone and voice response technology, the caller can search for a specific work of art by title and author. A caller can check the latest trading price of a piece as well as receive a list of all the available titles by that artist. If a dealer decides he wants to buy a piece, it is as simple as pressing "1" on the telephone, Sigel said.

"Once somebody buys, the dealer sends the artwork to us within 48 hours. We inspect it and send it on out," he said.

Art Co-op acts as a clearinghouse for the deal. It faxes the invoice and purchase order to the respective parties and certifies the work and the hands.

The co-op deals in limited-edition prints, serigraphs, photographs and cast sculptures and collects a 10% commission for its pains.

However, Sigel pointed out that with purchasing and selling concentrated in one clearinghouse, the possibility for multiple commissions is nil. The dealer also

saves time by working with one entity rather than creating a daisy chain of dealer inquiries.

Running since late last month, the co-op currently has about 1,000 U.S. art gallery dealers and 400 Japanese partners. Membership is free — the company makes its money on commission. Sigel said the network is not totally up to speed. "We're still inputting inventory," he said, adding that it should be complete in about three to four months.

Sigel said he originally planned the network to be computer accessible, "but I found that many gallery owners don't use computers. This allows the user an easier way of accessing the database," he said. He added that he is looking to add in PC access capability as the network matures.

Art Co-op's PC-based network helps dealers sell artwork such as "Jelly Bean Soda," pictured here

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IBM



NEW PRODUCTS

Electronic mail

Retix has announced OpenServer 400 for Unix Version 1.4, a product that provides coexistence between Open Systems Interconnect (OSI)- and Transmission Control Protocol/Internet Protocol (TCP/IP)-based networks.

According to the company, Version 1.4 provides users with the ability to achieve enterprise-wide messaging, without altering their software and systems environment. The product was designed to make use of the multitasking Unix operating system and offers simultaneous use of OSI and TCP/IP stacks on the same

local-area network adapter.

Prices start at \$5,950.

Retix
2401 Colorado Ave.
Santa Monica, Calif. 90404
(310) 828-3400

LAN software

PrimeService has announced Connection NetWare for Sun Microsystems, Inc.'s Scalable Processor Architecture (SPARC).

According to the company, it enables Novell, Inc. NetWare users to access SPARC files and share data, print services and applications with SPARC-based

workstations. Seamless integration lets user hardware and software applications and configurations remain unchanged when accessing the product. Connection NetWare for SPARC has security that is equal to or better than the native operating system, and it includes administration tools and utilities that are the same as the Novell NetWare personal computer line. Connection NetWare for SPARC costs \$5,795.

PrimeService
500 Old Connecticut Path
Framingham, Mass. 01701
(508) 620-2800

Spreadsheet Solutions Corp. has announced DigTerm, a shrink-wrapped solution that distributes Telerate Digital

Page Feed data across a local-area network.

Users of real-time Telerate data can receive information over LANs from personal computers running IBM's OS/2 operating system, the company reported. Users can view multiple pages of Telerate Digital Page Feed on one screen, and Dynamic Data Exchange can be supported as an option.

Prices are based on the number of users on the network. The Telerate Digital Page Feed controller costs \$650 per month, and the Presentation Manager terminals cost \$50 to \$75 per user per month.

Spreadsheet Solutions
600 Old Country Road
Garden City, N.Y. 11530
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Benefit boasts that once took forty-five days to publish now take less than five, a 900% increase in productivity. MICR-encoded checks and claims explanations are being printed and mailed together, saving \$350,000 a year in postage. And forms are now created electronically, on demand, reducing costs by 30%.

If saving time, money and customers is your idea of a productive partnership, let us help you put it together. Call 1-800-TEAM-XEROX, ext. 847G.

Xerox
The Document Company



Modems

Ven-Tel, Inc. has introduced the 24/2 with Fax, a Micro Channel Architecture V.22bis modem.

The product, designed for IBM Personal System/2 models, has a send-and-receive fax capability. Support for CCITT V.42 and Microcom Networking Protocol 5 data compression is included, and a Group 3, Class 1 and 2 fax standard provides send and fax capabilities at 9.6K bit/sec., the company reported. The modem is bundled with Quick Link II Fax, a communications and fax software package.

Ven-Tel's internal 24/2 with Fax costs \$370.

Ven-Tel
2121 Zanker Road
San Jose, Calif. 95131
(408) 436-7400

Best Data Products, Inc. has introduced the Traveler, a 9.6/4.8K bit/sec. send-and-receive fax and 2400 bit/sec. data modem.

The Traveler is battery/AC operated and combines V.42 bis and Microcom Networking Protocol in one portable package. The Traveler has a background mode that allows users to continue working in their current program when receiving a fax. Users can view, rotate, print or delete faxes.

The Traveler costs \$199.
Best Data Products
9304 Deering Ave.
Chatsworth, Calif. 91311
(818) 773-9600

LAN hardware

Xerox Corp. has announced the 7033 LAN Fax Server.

The 7033 LAN Fax Server allows for integration of the Xerox 7033 fax terminal into the network environment of Novell, Inc. local-area networks. Personal computer users can fax documents from a pop-up window on their screens.

It is not necessary to leave a computer application running under Microsoft Corp. Windows 3.0 or 3.1 or MS-DOS to fax a document. More than 350 fonts are supported using Hewlett-Packard Co.'s Printer Control Language printing format. Within their mailboxes, network users can access a list of faxes and either view, save, print, route, refax or delete each one.

The product costs \$7,895.
Xerox
Xerox Square 05B
Rochester, N.Y. 14644
(716) 423-5090

On-line services reach \$9.6B

Financial sectors lead in five-year sales totals

BY ELLIS BUCKER
OF STAFF

Real-time services in the financial sectors helped on-line services grow by 61.1%, to \$9.6 billion in revenue between 1987 and 1991, according to a recent report by Simba Information, Inc. in Wilton, Conn.

"Online Services: 1992 Review, Trends and Forecast" found that half the industry's sales came from real-time systems for the financial community, on-line brokerage information services alone accounted for 48% of industry sales.

Consumer-oriented services such as CompuServe and Prodigy, while the fastest growing component of the industry, accounted for only 4% of revenues in 1991.

Clattered by recession

"The biggest surprise was how bad a year 1991 was," said Simba analyst Chris Ewell, who noted that the recession dampened the use of on-line services for things such as credit checks and stock market updates.

More broadly, however, Ewell said business applications for

Cash market

The primary use of on-line services are in the financial sector, although there is rapid growth at the consumer level as well

	1990	1991	Percent of 1990 total	Change
Brokerage	\$4,408	\$4,658	48%	5.7%
Credit	\$1,648	\$1,678	17%	1.8%
Financial news/Research	\$1,448	\$1,588	16%	9.6%
Legal/Regulatory	\$671M	\$711M	7%	5.9%
Professional	\$561M	\$615M	6%	5.8%
End user/Consumer	\$259M	\$344M	5%	33.9%
Marketing	\$228	\$31M	<1%	37.4%
Total	\$9,208	\$9,658		6.7%

Source: Simba Information

C/S Chart: Synchro Finance

on-line information networks are mature and may be saturated. "We're seeing growth rates just a bit higher than the rate of inflation" in this market, he said.

The hope for the on-line industry, Ewell continued, is the great and largely untapped consumer market. Simba predicts that on-line consumer services will grow 145%, and sales industrywide will grow 48% to \$14.2 billion during the next five years.

On to crack the consumer market, on-line providers will have to improve the presentation of their user interfaces, making them more intuitive and graphical.

A limiting factor, Ewell said,

is the network infrastructure, which at present lacks the bandwidth needed to offer images and graphics comparable in quality to that most pervasive of all consumer information media: television.

As on-line industry revenue increases, so does the number of on-line subscribers. The Simba report found that leading on-line services finished 1991 with nearly 5.4 million subscribers, an increase of 18% compared with year-end 1990.

Meanwhile, the number of database providers and databases rose to 2,120 and 4,869, respectively, according to the Simba report.

3Com software tools support SNMP

CONTINUED FROM PAGE 69

continuing PC vendor, microprocessor type and cycle rate, operating system type and version, adapter type and configuration, user name, PC name, location and phone number. This information is typically not collected by a manageable hub, 3Com said.

Christianson praised Link-Watch's ability to automatically create a topographical map of the LAN and load configuration information based on each PC's net.config file. Hewlett-Packard Co.'s OpenView, in contrast, requires the network manager to load the information manually, "which is cumbersome and time-consuming," he added.

While SNMP has become a widely used de facto standard for the LAN bridge, router and hub industries, it has made scant inroads at the PC LAN adapter level, according to Brad Baldwin, an industry analyst at Gartner Group, Inc., a Stamford, Conn.-based research firm.

Indeed, while 3Com's SNMP product also supports 10Base-T hub-based LANs, it targets users who run their LANs over coaxial cable and thus cannot take advantage of the network management features — SNMP or otherwise — that most intelligent hubs offer, Baldwin said.

Coaxial LANs still make up the majority of LAN installations, with coaxial and hub-based LAN shipments likely to be about 50-50 by year's end, he added.

The first three

Although Cabletron Systems, Inc. now supports SNMP on its adapters as well as its hubs, 3Com is the first of the three leading Ethernet adapter companies to support SNMP, Baldwin said. The other two leaders are Standard Microsystems Corp. and Eagle Technology Corp.

Link-Watch is likely to appeal to users because the software is license, which is valid for one installation and can manage up to 251 nodes, costs only \$395.

Another appealing aspect of Link-Watch is the fact that most of the software resides on the adapter driver, so it takes up only about 2K to 6K bytes of memory on a DOS PC, according to 3Com. In contrast, other LAN workstation monitoring packages take 20K to 80K bytes on a DOS PC, 3Com said. Part of the software also resides on a Novell, Inc. NetWare server as a Netware Loadable Module.

Link-Watch, available now, was designed to work with 3Com's EtherLink family of

adapters and NetWare 386 servers v3.11 or higher. The software package is said to interact with any network management system that conforms to the SNMP Management Information Base II standard. These include Sun Microsystems, Inc.'s SunNet Manager, 3Com's Isoview and HP's OpenView Network Node Manager.

Remote users get TCP/IP sans LAN

BY JOANIE M. WEXLER
OF STAFF

MEQUON, Wis. — The industry forged ahead with delivering networking capabilities to remote users recently when Frontier Technologies Corp. rolled out software said to bring full Transmission Control Protocol/Internet Protocol (TCP/IP) networking to far-flung desktops over telephone lines.

The company's product, dubbed Super-PPP, is software that is layered over the Microsoft Corp. Windows operating environment and Frontier's TCP/IP or industry-standard Open Systems Interconnect communications protocols.

This lets users TCP/IP functionality such as terminal emulation, file transfer, printing and Simple Network Management Protocol management over serial lines via the industry-standard Point-to-Point Protocol (PPP) without the user's having to be on a local-area network, the vendor explained.

PPP adds error correction, retransmission and speed to the older Serial Line Internet Protocol (SLIP) for remote TCP/IP networking, observers noted.

Best of both worlds

The product is intended to blend the SLIP economies of networking over phone lines "with the reliability of the X.25 protocol," which requires leased lines, said Ray Langford, engineering manager at Frontier.

Speedwise, PPP could translate into a tenfold improvement over SLIP, depending on the nature of the data, said Mike Kantrowitz, vice president of marketing at Human Designed Systems, Inc., an X Window Sys-

tem terminal vendor in King of Prussia, Pa.

Human Designed Systems bundled its own version of PPP into its X terminals after rigorous performance testing of PPP and SLIP, he said.

San Diego-based AGE Logic, a maker of personal computer X server software, is considering licensing Super-PPP to bundle into its software, which allows users to access multiple hosts si-

THE PRODUCT is intended to blend the Serial Line Interface Protocol economies of networking over phone lines 'with the reliability of the X.25 protocol.'

RAY LANGFORD
FRONTIER TECHNOLOGIES

multaneously on a PC screen, said Peter Suh, company president. AGE Logic's X server software is Windows-based.

Kantrowitz said a limitation of the Microsoft Windows version is that users cannot run applications locally because of the non-client/server nature of Windows. This means users must tax host resources to run applications remotely instead. The limitation, however, has to do with the Windows operating environment, not the network.

The Super-PPP can also function as a low-end IP router if the PC has an Ethernet adapter card, Frontier said. The software is slated for availability next month.

IRS chooses X.400 as mail package

CONTINUED FROM PAGE 69

pared with feature-rich proprietary systems from the likes of Beyond, Inc., CC-Mail, Inc. and Microsoft Corp.

However, "we feel we're getting about 98% of those systems' features," Foley said. In addition, he noted, many proprietary LAN mail functions disappear once a message has been translated in a gateway and is shipped to another network.

The IRS maintains that within a year, its network will be less costly than a patchwork of proprietary systems. This is in part because the IRS' Southeast region is able to route message packets out over FTS-2000 network service provider Sprint

Corp.'s X.400 transport service, which charges on a per-message basis. The other alternative would be to use the non-X.400-based Sprintmail wide-area mail network at a fixed monthly charge, the IRS explained.

The IRS Southeast region has 800 users on Osiway and expects that number to grow to 1,000 this year "for less than half of the annual cost of Sprintmail," Davis said.

Hardwarewise, the only investment the IRS made was in a dedicated Compaq computer Corp. SystemPro server running The Santa Cruz Operation's Unix and Osiway software. It serves as a switching hub among

the network segments.

Foley explained that the IRS customized Osiway's manual directory synchronization so that changes to the mail network are automatically updated enterprise-wide. Meanwhile, the IRS intends to participate in a pilot of X.500 — X.400's directory counterpart currently undergoing interoperability testing by the three major long-distance carriers — next year.

"Right now, everyone in the IRS Southeast region can locate any other user in the region," Foley explained. OSI's X.500 would allow the region to expand that accessibility to all other X.500-listed users, he said.

LARGE SYSTEMS

HARDWARE • SOFTWARE • STRATEGIES

Multitasking RAID for supercomputers debuts

BY JEAN S. BOZMAN
OF STAFF

SAN JOSE, Calif. — Maximum Strategy, Inc., a small Silicon Valley firm that has been building redundant arrays of inexpensive disk (RAID) systems since 1987, last week announced a multitasking RAID system for supercomputers and parallel processors.

The new RAID drive will go to beta-test sites this month, and general shipments are to begin in September, the firm said.

The firm's new Gen 4 product can handle RAID-1, RAID-3 and RAID-5 functions simultaneously on different disk regions. That way, disks can be set aside for RAID-1 mirroring, RAID-3 high-performance or RAID-5 error-recovery features.

"You can dedicate a set of disks to operate in one RAID mode or the other," said Omri Serlin, president of Inter International in Los Altos, Calif. That would suit scientific computing, which typically deals with large data sets that can hamper high-speed disk performance.

Del Masters, Maximum Strategy's chief executive officer, said Gen 4 would be able to handle 500 I/Os per second to the supercomputer or Unix server. Data will be transferred in 64K byte units, Masters said.

The Gen 4 RAID Storage Server can support as many as 40 disk drives with sustained throughput of 90M byte/sec. for reads and 85M byte/sec. for

writes. It conforms with the international standard for high-speed data transfer and is compatible with supercomputers from Cray Research, Inc., IBM and Maspar Computer Corp. Prices range from \$175,000 to \$475,000, Masters said.

The California Institute of Technology, a user of Maximum Strategy's Gen 3 RAID device since February, has had little problem with reliability since the product was installed.

"Even when our large supercomputers had [operational] problems, the Maximum Strategy box kept going like a soldier," said Roy Williams, senior staff scientist at CalTech's Concurrent Supercomputing Facilities.

Small and proud

Maximum Strategy was privately funded and grew by sales of its high-end peripherals to large systems vendors such as IBM, said Gary Snaib, principal at the Snaib Group in Minneapolis. "They are a bootstrapped organization and proud of it. They've done all on their own."

The 30-person firm designs RAID controllers — but does not build them — and then packages the controller with disk drives from other vendors.

Although prices for the RAID devices seem high, they are priced to be less expensive than those sold by supercomputer vendors, Snaib said. "It is definitely an impressive technology, but it is still aimed at a limited market," Snaib noted.

Manufacturers turn to imaging

On-line engineering documents spell efficiencies for companies

ANALYSIS

BY ELLIS BOOKER
OF STAFF

Speed to market, fewer mistakes and the ability to adapt products quickly are some of the reasons a handful of manufacturers have begun installing electronic document imaging systems.

In addition to conventional applications of imaging in their clerical departments, manufacturers are using imaging as a tool for routing drawings and technical documentation among designers, engineers and the factory floor. For one aircraft maker, this has reduced the time needed to process drawings from as much as eight days to only 12 hours.

According to BIS Strategic Decisions in Norwell, Mass., the manufacturing sector (comprising both discrete and process manufacturers) accounted for \$228 million of the \$1.9 billion imaging market last year. But that share should grow. The research firm predicted that manufacturers will represent \$358 million of the \$2.35 billion imaging marketplace in 1992.

Like imaging users in commercial settings such as banking and insurance, manufacturers are looking to imaging as a way to control, streamline and automate the flow of records.

At The Boeing Co.'s Commercial Airplane Group, for instance, an imaging subsystem known as Reference Engineer-

ing Data Automated Retrieval System (REDARS) reduced the flow time of engineering changes by up to 90% and cut by 80% the amount of time engineers and others waited to see data.

Deployed in December and using a high-speed Fiber Distribu-

ted "aperture cards." This required a staff of 100 people to sort, file and fetch the cards. Another 10 million to 12 million obsolete aperture cards are stored in the paper files.

"We've also reduced the amount of time it takes to get a



John Dehn

ted Data Interface, backbone network connecting some 200 Sun Microsystems, Inc. workstations, Boeing's system has more than 1T byte of information on 140 optical discs. The database includes more than 3 million graphics images created by Boeing's computer-aided design (CAD) system.

In the past, these CAD images would have been output to microfilm and posted onto so-

drawing released from engineering and sent to the factory floor from six to eight days down to 12 hours," said Norman L. Eddy, senior manager of systems management at Boeing Support Services in Seattle.

Along with engineering diagrams, REDARS contains all of Boeing's technical documentation and parts lists.

REDARS also highlights two

Continued on page 72

E-Mail = Emc²/TAO LAN

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Migration woes promise gold

BY MARK HALPER
CW 10177

EL SEGUNDO, Calif. — For Gary Osborn, chief information officer at Hughes Electronics Space and Communications Division, choosing Unix servers for the division's operability-downloading project has been a head-spinning lesson in the politics and countermeasures of open systems.

As the company talks to suppliers to determine which platforms to install for a three-phase move off its eclectic collection of mainframes and minicomputers, Osborn said he has been nothing short of confused.

"All the vendors say they are what they are and that everyone else is a liar," Osborn noted. "I'm having a difficult time sorting it out."

Osborn's difficulties have not, however, prevented him from proceeding with some decision-making: He has tapped Hewlett-Packard Co. for four HP 9000 Series 847s for the first phase of the project.

No more going without

The first stage is an ambitious one: Putting integrated computing power in the hands of hundreds of designers, shop floor workers and business managers who until now "have simply gone

without" the strategic information that the distributed HP system will start putting in their hands later this month, said Chris Pidgeon, chief information technologist at the division.

When the project is completed later this year, roughly 800 personal computers and Apple Computer, Inc. Macintoshes will tie into the HP 9000, accessing an integrated applications package called Cambridge from Cambridge Technology Partners that ties together information from Hughes' finance, scheduling, material, inventory, engineering and manufacturing operations.

In the company's current hierarchical model, information access for hundreds of shop floor workers, warehouse folks and designers typically means contacting a proxy in Hughes' information systems shop who taps the requested data and then delivers it by paper, mouth, disk or some other medium. "Sneaker-net" has been the norm here. The goal is near-instantaneous access.

"It takes them a week: They have to go through eight people and collect information in different media," Osborn noted. "By the time they get the information, it's useless."

These people include designers who need access to information, program managers respon-

sible for building products and group business managers.

The workers have access to about 60 PCs now, but they use them to run basic spreadsheet applications. Osborn said Hughes will tie the 60 into the HP 9000s just as it will the other 740 or so, through Transmission Control Protocol/Internet Protocol connections over Ethernet. The company plans to install 400 of the new machines by the end of this month and another 400 by year's end.

The company will also tie about 150 Sun Microsystems, Inc. workstations into the Cambridge software after it brings the PCs on-line, Osborn said. Those workstation users are designers who do not require business information as often as operations people. "We don't put them in a category of being decision makers," Osborn said.

Moving off the mainframe

In other downsizing plans, Hughes plans to take its manufacturing resource planning (MRP) software off the mainframe starting in the first quarter of 1993 and to move its engineering data off in the third quarter.

But as it expands Cambridge with two more Unix servers and moves toward open MRP and engineering data solutions,

ON SITE

Hughes Electronics Space and Communications Division El Segundo, Calif.



Gary Osborn, CIO

- **Challenge:** To put integrated computing power into the hands of designers, shop floor workers and business managers.

- **Technology:** Hewlett-Packard HP 9000 Unix systems, 800 PCs and Cambridge Technology Partners software that ties together information from diverse operations.

- **Goal:** To reduce from one week to only seconds the time it takes to gather information from varied sources.

Hughes will not necessarily choose the HP 9000 every time.

"It'll all boil down to price and performance," Osborn said. "We're right now benchmarking Sun to see if it could perform equal to or better than HP."

One consideration is what software is available for each platform. In the MRP evaluation, the company has decided to use Computer Associates International, Inc.'s CASH/AD, which CA recently announced it is migrating to HP's HP/UX operating system — CA's first large system Unix port.

But, according to Osborn, CA also plans to make the program available for Sun platforms, so Sun is very much in the running

for the MRP job.

If Osborn and his staff are caught up in Unix fever, they have apparently not been completely swept away. Osborn noted that the company will continue to use a 3090 mainframe for financial programs that provide information on labor costs, purchase rates and subcontract conditions.

Osborn's reasoning on the financial program may be no more complicated than his hands are tied. His division shares the 3090-based financial information with other Hughes divisions from the parent's mainframe. "It's a corporate system, so I doubt I'll be coming off it," Osborn said.

Manufacturers using imaging for documents

CONTINUED FROM PAGE 71

of the unique requirements of imaging in manufacturing: graphics and interfaces to CAD systems.

While banks, insurance companies and other commercial imaging sites have some need for graphics, notably for signature display and verification, a significantly larger percentage of the paperwork at a manufacturing company is devoted to technical drawings and schematics. REMARKS, for instance, not only imports and exports data to a parts and document "accountability" system, but also works with Boeing's CAD system.

According to some analysts, creating these CAD-to-imaging interfaces can be tricky because the graphics in imaging systems are raster-based, whereas CAD systems use vector graphics.

On the other hand, some manufacturers have found the process worth the work because the imaging system becomes a kind of common denominator for incompatible CAD systems.

This has been one of the benefits of the Apple Document Management and Control System (ADMACS), Apple Computer, Inc.'s 18-month-old global imaging system. ADMACS provides on-line access to more than 120,000 pages of drawings and product documentation (see story at right).

At Apple and other manufacturers, imaging coupled with document management and work flow software have also virtually eliminated the problem of building a part based on a design that has been modified and is no longer the current version.

The Gillette Co.'s North Atlantic Group is using an imaging system from Cinagra Corp. in Ann Arbor, Mich., to store what will total more than 100,000 technical documents by year's end.

Like many manufacturers, Gillette has maintained vast libraries of microfilm aperture cards to hold its technical documentation. It was a nightmare controlling these documents; we were drowning in a sea of paper," said Ed Ryan, group manager of project management and implementation at Gillette.

A final application of imaging in manufacturing relates to customer support.

Last year, Knoxville, Tenn.-based Whirlpool Corp. installed

an imaging system on Online Computer Systems, Inc. in Germantown, Md. The imaging system provides customer service agents with access to two de-

cades worth of service and product manuals (CW, Oct. 28, 1991).

In a recent member survey by the Association for Informa-

When Jackie Streeter joined Apple Computer, the company built one kind of Macintosh.

When that changed and Apple began filling out its Macintosh line, Streeter, manager of worldwide product configuration management, began looking at alternatives to the proprietary system for tracking and exchanging engineering documents.

The result was ADMACS, or Apple Document Management and Control System.

With its core software from Alpheria, Inc. in Camarillo, Calif., and system integration services from Electronic Data Systems Corp., ADMACS was plotted 18 months ago; for the past year, it has been the official repository for some 120,000 Apple engineering documents.

Aside from substantial productivity gains, Apple has used ADMACS as a common window onto its diverse CAD systems.

Instead of arming each employee who needs access to the on-line drawings with "a \$40,000 to \$50,000 workstation, each loaded with \$20,000 to \$30,000 worth of CAD software," Apple is using its own Macintosh as the client for the imaging system, according to Tom Maick, director of information systems at the Apple Product Division.

About 600 employees have access to ADMACS today. The ADMACS host is a Digital Equipment Corp. VAX in Napa, Calif.

But Maick noted that because Apple elected to use the Macintosh — typically, a 4M-byte machine running Apple's System 7.0 operating system — and send the images across the corporate Transmission Control Protocol/Internet Protocol network, access to the engineering documents is theoretically available from every employee's desktop.

Before ADMACS, turnaround time for design changes could be as much as 25 days, with drawings on microfilm frequently shipped back and forth to Apple's manufacturing sites worldwide.

Today, turnaround is 30 days and dropping. "Some changes are down to one day," Streeter said.

Streeter stressed that in addition to imaging, the ADMACS project was taken as an opportunity to redesign many business processes at Apple, resulting in even more efficiency.

In fact, that standardization of processes helped win Apple ISO9000 certification on its first attempt — a rare feat. A European Economic Community business license, ISO9000 mandates standardized business procedures.

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NEW PRODUCTS

Software application packages

Integral Midrange, a division of Integral Systems Co., has enhanced the IBM Application System/400 versions of Integral's Human Resource and Financial products with Release 5.0.

Release 5.0 contains Systems Application Architecture-compliant commands and features color support and full use of all AS/400 utilities. Tools that control human resources-related functions are provided.

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Integral Midrange
2185 N. California Blvd.
Walnut Creek, Calif. 94596
(510) 939-3900

Database management

Management Information Technology, Inc. has started shipping an enhanced version of DBA-Master.

DBAMaster 2.0 was designed as a four-function, automated monitoring and tuning device that lets Oracle Corp.'s database users detect and avoid potential system-crashing problems.

New features in this release include remote monitoring and multidatabase support, reduced storage requirements, tuning of the Oracle Parallel Server and support for Oracle Version 6.2. Row-level and chaining analysis, production reports with full table scan and monitoring over SQLNet are other new features. Pricing begins at \$2,500.

Management Information Technology
2895 Temple Ave.
Long Beach, Calif. 90806
(310) 424-4399

BrownStone Solutions, Inc. has enhanced Version 5.0 of its DataDictionary/Solution.

Enhancements include Scripting, Forms Facility and DDSMail. According to the company, Scripting offers users the ability to automate complicated

dictionary tasks such as restructuring DB2 tables. Forms Facility provides external layouts that display a user view of a data dictionary without altering the underlying object definitions. Users can send messages and receive results of automated operations via DDSMail.

Prices start at \$60,000.

BrownStone Solutions
295 Madison Ave.
New York, N.Y. 10017
(212) 370-7160

Data storage

Tem X Technology, Inc. has developed the OptiChanger 28, a five-cartridge drive optical subsystem.

OptiChanger 28 uses 12-in.,

5.6G-byte, write-once read-many cartridges, which provides Sun Microsystems, Inc. Scalable Processor Architecture II users access to a minimum of 28G bytes of permanent data storage. OptiChanger 28 includes simultaneous access to both disk sides, fast disk spin up, spin down and disk exchange times.

The product does not require software drivers, and it features

hardware data compression and 512K bytes of nonvolatile static random-access memory for enhanced cache buffering.

OptiChanger costs \$39,950.
Tem X Technology
Suite 3300
Building 3
4807 Spicewood Springs Road
Austin, Texas 78759
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APPLICATION DEVELOPMENT

CASE • LANGUAGES • TOOLS

IN BRIEF

Focus 4GL upgraded for AS/400

■ **Information Builders, Inc.** announced an upgraded version of Focus 4GL for IBM's Application Systems/400.

Available immediately, Release 5.8 sports enhanced report writing and decision support modules, the company said. Prices range between \$3,000 and \$10,000.

■ **Shortly after announcing a merger with AI Corp., Alion Corp.** introduced Logic Management System, a tool designed to let users—rather than information systems workers—modify an application's business process rules. The \$2,000 to \$5,000 product is currently in beta testing, with general release scheduled for later this year. Both companies emphasized that despite the agreement to merge, each firm's product lines would remain distinct and consistent with separate statements of direction that were outlined earlier this year.

■ **Ada supplier Meridian Software Systems, Inc.** in Irvine, Calif., has entered into a definitive agreement to be acquired by Veritex Corp. in Herndon, Va. Veritex, which develops embedded computer, technical computer-aided software engineering (CASE) and secure systems products for government and industry, will swap 1.2 million shares of its common stock—about 8% of its outstanding shares—for Meridian stock.

■ **Borland International, Inc.** will begin handling ProtoView Development Co.'s ProGen Application Generator CASE tool with its Borland C++ Version 3.1 compiler and its Borland C++ and Application Frameworks 3.1. ProGen is an ANSI C code generator for interface design and implementation.

Development centers battle to get it done

BY GARRY RAY
OF EMMET

Call them application development centers, application enabling centers or technology centers. Whatever the name, they provide their organizations with evaluations, guidance and implementations of "bleeding-edge" development tools and methodologies.

But their unique role in the information systems organization and in the company as a whole poses some challenging management problems. Chartered with examining such diverse concerns as strategic planning, joint application development, systems planning, data modeling and everything in-between, application development centers often cannot implement the tools and methods they have discovered.

According to Jerry Weinberg, a Lincoln, Neb.-based consultant on IS and organizational change, "For every 100 development centers, 75 know what to do, and only 10 actually get the organization to do it."

Historically, application development centers have suffered from the problems of having a clear mandate to explore and evaluate advanced technology but little means or capacity to implement it in their companies.

At Teacso Inc. in Houston,

Cardinal rules

Key steps in motivating the application development center staff:

- Create development center teams that have a mixture of those who initiate and those who respond to new ideas.
- Close the loop. Structure development center positions to include general and specific, goal-directed feedback.
- Provide more autonomy. Set goals, give deadlines, and then back off.
- Increase skill variety. Development center staff members are learners and should have a forum to explore new ideas and technologies.
- Increase task identity—the wholeness or completeness of the project—by allowing staffers to visit user and staff meetings.
- Increase task significance. Reinforce the importance of the application development center by allowing personnel to give status reports and presentations.

an early attempt to create an application development center resulted in a "failure to implement because there was no mandate to do so," said Walter Viall, manager of the company's IS Enabling Center.

Even where there is a mandate to implement new tools and technologies, application development centers often meet substantial resistance from programmers and other IS staffers. The problem, Weinberg said, is "an emotional issue, not a technological issue."

Internal battle

According to Viall, "The initial clash was ferocious because development center people are very technical and perfectionists." The interests of these

champions of leading-edge technology "were colliding with [programmers], who have a vested interest in the status quo," he said.

To solve the problem, Teacso placed Viall in charge of its application development and development center organizations. "I have some ideas of where I'm going, and I'm not afraid of ruffling feathers or stepping on toes," he said. "That motivates them."

Most development center managers agreed that the vision of a leader was critical to the center's success. "The most important thing is to allow [staff] to go out on their own, but with a vision of the way things should be," said Ron Guallier, a computer scientist and development center leader at EG&G Florida,

Inc., a NASA contractor at Kennedy Space Center in Florida.

Guallier also makes sure his team is recognized internally through regular participation in a company newsletter and other public relations efforts, such as training members of the computer center in new technologies and keeping them posted on "our strategic direction over the next five years," he said.

Hoppler and booster

"What we're trying to do is increase morale and the ability of the staff to get things done," said Dennis Farley, president of the Development Center Institute, Inc., and a development center manager at Ameritech Services in Indianapolis.

Using research from Zawacki and Associates, a Colorado Springs consultancy that has profiled a number of application development centers, Farley has been giving staffers more feedback and has been "structuring their jobs so that there aren't as many distractions," he said.

Robert Zawacki, principal of the Colorado firm, said in his recent study of development centers that staff members should be given more feedback and autonomy in their jobs. They also need to see the "wholeness of the project" and its relevance to the organization in order to be effective, he said.

TI speeds up Unix move through Sequent deal

BY KIM S. NASH
OF STUFF

DALLAS—Texas Instruments, Inc. has agreed to part in computer-aided software engineering (CASE) tools to Symmetry 2000, a line of high-end Unix-based machines from Sequent Computer Systems, Inc. The move is part of TI's strategy to lure customers looking to "right-size" systems from proprietary mainframe environments to smaller Unix systems.

Observers said TI is ahead of integrated CASE rival KnowledgeWare, Inc. in Atlanta in terms of development tools for Unix. KnowledgeWare said it is working on Unix tools and expects 1993 to 1994 for their debut.

Meanwhile, vendors such as Cadre Technologies, Inc. and Interactive Development Environ-

ments, Inc. have built market share among technical Unix users.

Double dealing

IBM and Hewlett-Packard Co. signed separate deals eight months ago with TI [CW, Jan. 27]. TI's Information Engineering Facility (IEF) also runs on Unix hardware from Digital Equipment Corp. and Tandem Computers, Inc.

However, what makes the Sequent deal different from the others is the Symmetry 2000's capacity for on-line transaction processing in an open environment, according to Roy Brittain, vice president of business development at TI's Information Technology Group.

An early user agreed: IEF-based applications run on the Symmetry 2000 "achieve three to five times the price/perfor-

mance ... compared with proprietary mainframes," said Steve Darrow, president of Claremont Consulting Group, Inc., a CASE consultancy in Beaverton, Ore.

It was fully integrated CASE for Unix, not economics, that attracted Oregon's Department of Environmental Quality to the IEF/Symmetry combination, according to Dennis Kirk, information systems manager at the department. The state agency, located in Portland, has started building new systems with IEF in a 3-year-old Symmetry environment. IEF replaces an ad hoc mix of report writers, forms generators and a fourth-generation language from Oracle Corp.

The department will keep Oracle's database management system but will throw out Cobol and Fortran, Kirk said. "Environmental legislation changes continuously, and those tools don't let us alter programs quickly enough," Kirk explained.

noting the 60- to 90-day limits tied to many new laws. Reasonable IEF models let Kirk's staff locate appropriate blocks of code quickly and save programming steps, he said.

WHAT MAKES THE Sequent deal different from the others is the Symmetry 2000's capacity for on-line transaction processing in an open environment.

For Sequent, the agreement is part of an effort to expand beyond its specialty markets, such as financial and scientific processing, into more mainstream commercial computing.

Sequent, also based in Beaverton, will sell Symmetry 2000 systems bundled with IEF by the end of this year. However, the IEF Central Encyclopedia, a repository needed for large-scale CASE projects, is not scheduled for release until early next year.



WordPerfect answers the most-asked question about electronic mail.

Click on "Send" in many of today's e-mail packages, and the urgent message on your screen will disappear, perhaps never to be heard of again.

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With WordPerfect Connections (included in Office 3.1), a DOS and Windows LAN can connect seamlessly (and transparently) with VAX and UNIX LANs, for example. So a message that goes out in Windows can arrive in UNIX and lose nothing in the translation.

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Far-flung empires will find WordPerfect Office equally accommodating, with gateways to messaging systems that include Novell MHS, IBM OfficeVision, DEC, X.400, SMTP, MCI Mail and AT&T EasyLink, among others.

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COMMENTARY

Martin Healey

Options to ponder when downsizing

The unavoidable problem with downsizing is that the new system is different from the old one. The new computer should be state-of-the-art technology that is cheaper than the old one, but the total cost of ownership needs much more consideration.

Unix systems, for instance, are relatively cheap to buy. But to make a comparison with, say, the IBM AS/400, you must add the price of a database management system, compilers or 4GLs and system management tools before a fair comparison can be drawn.

In most cases, Unix system management tools are relatively underdeveloped and can result in increased costs. With distributed systems, for example, "community management" tools are anything but established products, although there are hopeful signs from HP, ICL and Siemens-Nordrup.

The right way

While getting the system environment wrong can be costly, the potential for getting the applications wrong is even greater.

There are two basic approaches to creating the applications for the new "downsized" system: developing them in-house or buying a packaged solution.

If programs are to be developed anew, now is the time to exploit different techniques. Relational databases, CASE tools (particularly for business analysis and system design), 4GLs and client/server architectures with GUIs are all serious candidates for consideration.

Use REXX for all procedure automation routines as well. It is the only job-control language (JCL) supported on multiple platforms, and it is good. It hurts to see people struggling with Unix shell scripts when the proper tools are available.

Rather than follow traditional development paths, packages normally have far more to offer today. Indeed the "box drawer" packages is the "out-invented-here" syndrome because the same people who were responsible for developing older applications must control the implementation of the package. The cases where packages have been failures (apart from picking an inappropriate or simply bad product) are due to a lack of cooperation by both in-house programmers and end users.

Not-invented-here among users is as bad, if not worse, than among programmers. It is unreasonable to expect some changes to business practices to fit the package if they are not radical.

Muddle with care

A package in a building kit and should be treated by in-house staff as a very high-level language. It needs configuration and all the training and management procedures must be effectively implemented. The package will probably only achieve 80% of the requirements — the other 20% must be provided by specifically developed code.

But never modify the package code, or else future releases will cause trouble. And never accept a package for which the data structures are not fully specified and available for new programs. Avoid packages written in C or Basic unless an alternative cannot be found.

Packages offer a share of accumulated knowledge about applications because there is feedback from multiple users.

However, the other source of accumulated knowledge is the older systems being replaced. Therefore, there is a temptation to convert the old programs to run in the new environment.

Goals, conversion, and the associated JCL and data conversion, is difficult and much more expensive than it is often admitted. The key problem is that the mainframe provides both batch and transaction processing services with the same databases. The batch, however, is optimized to take advantage of sequential processing with data prefetch, sorting and direct indexing. The new "downsized" system will be basically time sharing that does not provide any special batch capability or specialized transaction processing monitor.

In all fairness

To be fair, the RDBMS provides all basic services, such as transaction logging, roll-back and forward, etc., but an application system designed for batch and transaction processing will never fit comfortably in a mainly interactive/transaction processing environment. Thus, even if the old code and data can be converted, the new application will be clumsy and will not exploit the technology of the new system. The danger of code conversion is finishing up with the worst of both worlds.

If it is difficult converting from one batch/transaction processing environment to another, conversion to an interactive environment can cause serious problems. Conversion would need to show major cost advantages to win over introducing a packaged solution today.

Healey is a consultant based in Coventry, England

Apple rolls out tool upgrades

BY JAMES DALY
CW 5509

CUPERTINO, Calif. — Apple Computer Inc. recently unveiled a platter of programming tool upgrades that include refreshed versions of MacApp, the Macintosh Programmer's Workshop (MPW) and MPW C++.

MacApp 3.0 is the latest version of Apple's object-oriented application framework and class library for Macintosh programmers. It equips developers with the objects needed to program standard elements of Macintosh applications such as scroll bars, multiple windows, printing, cut and paste, Undo and menus.

Version 3.0 adds System 7.0 support and a new version of the MacDraw source code browser/editor and the ViewEdit in-

terface building tool. It will be available for \$395 on disks and \$350 on compact disc/read-only memory (CD-ROM). Upgrades cost \$250 and \$200 on disk and CD-ROM, respectively.

Full of features

MPW Version 3.2.3 updates Apple's professional software development environment. It provides a foundation on which to create applications with features such as multiview editor, integrated compilers and tools, a full scripting language, a source-code control system and the ability to link together code written in multiple languages.

Version 3.2.3 adds top performance improvements, command reference features and compatibility for Apple's high-end Macintosh Quadra. The up-

graded development environment will sell for \$150. An update will cost \$25.

MPW C++ with Version 3.2 is an object-oriented C++-to-C translator designed to work with MPW C and the MPW Development Environment. Apple has enhanced C++ to support the Macintosh Toolbox and operating system, object-based functions and procedures. It will sell for \$175, and an upgrade will cost \$75.

The tools will be available through Apple's source for developer's tools, both as stand-alone objects and on the E.T.O. No. 8 Essentials. Tools. Objects CD-ROM, a CD-ROM based quarterly of Apple's software development tools. Site licenses and bundled applications are also available.

NEW PRODUCTS

Languages

The basic Rock development library costs \$7,800.

Carnegie Group

5 PPG Place
Pittsburgh, Pa. 15222
(412) 642-6900

Qualix Group, Inc. has announced the C++ Starter Kit, a collection of software and tutorial materials.

The kit was designed to be used with Sun Microsystems, Inc.'s Scalable Processor Architecture-based workstations. According to the company, the goal of the Starter Kit is to provide Unix users with an affordable way to learn C++ and to understand the object-oriented programming techniques that C++ supports.

The product consists of a Sun file system compact disc that has sample libraries and programs.

The kit costs \$99.

Qualix Group

Suite 224
1900 S. Norfolk St.
San Mateo, Calif. 94403
(415) 573-0200

Code libraries

Carnegie Group, Inc. has released Rock 2.1, a frame-based, high-performance technology engineered for knowledge and information representation.

A C++ library, Rock 2.1 was designed to develop applications that need the integration of complex data relationships and knowledge. The product features a new interpreter module that lets users dynamically browse, modify and interact with a Rock (Representation of Corporate Knowledge) knowledge base during development, the company reported.

Enhancements include inter-process communication in a client/server environment, integration with relational databases and permanent storage of the knowledge base in an integrated frame base.

Application development tools

NeuralWare, Inc. has announced NeuralWare's Professional II Plus, a neural network development tool for use on Silicon Graphics, Inc.'s Iris line of reduced instruction set computing-based systems.

The product was written in C and offers prototyping and concept testing of neural network designs for a number of data-intensive, time-sensitive and quality-dependent applications, the company reported. Features include an open architecture, graphical user interface and support for more than 22 major neural network types.

NeuralWare Professional II Plus costs \$4,995.

NeuralWare
Building IV
Penn Center West
Pittsburgh, Pa. 15276
(412) 787-8222

Sky Computers, Inc. has announced Skyview Release 3.0.

The product is a software tool kit designed for the SkyStation and Skybot application accelerator product lines. This release includes Skyview multitasking executive, a feature that simplifies software development and execution in application environments involving several tasks, the company reported.

Skyview Release 3.0 prices start at \$5,000.

Sky Computers
27 Industrial Ave.
Chelmsford, Mass. 01824
(508) 250-1920

Microware has released Version 3.0 of Micro Focus 370 Assembler with Animator/370.

The Animator/370 is an advanced debugging tool that lets users analyze programs during execution. The company said the product was designed to allow mainframe users to use a personal computer to support stand-alone assembler or Cobol programs housing Dynamic Calls to assembler.

New features include Animator/370, On-Line Help and extensive file handling.

Part of the Animator/370 is the Help/370 facility, an on-line description of the 370 instruction set. The extended file handler provides additional file processing capabilities and has a define-cluster option.

The full development set costs \$3,250.

Micro Focus

2465 E. Bayshore Road
Palo Alto, Calif. 94303
(415) 856-4161

SmartStar Corp. has released Version 6.1 of SmartStar VMS, a VAX/VMS application development environment. SmartStar VMS now offers support for The Ask Co.'s relational database management system.

According to the company, enhancements have been made to the SmartStar Logical Database for heterogeneous database access. When the product is used in conjunction with an optional SmartStar Distributor component, users can seamlessly access a variety of database types. Features such as pop-up windows, pull-down menus and an OS/2-like windowing interface are included.

Prices range from \$2,000 to \$140,000.
SmartStar
120 Cremona Drive
Goleta, Calif. 93116
(805) 685-8000

EXECUTIVE REPORT

MAKING TECHNOLOGY PAY

The new spin-offs

U.S. companies are trying to turn technology investments into cash with start-ups in a hot new field: Computerized distribution logistics



Menlo Logistics' Williford: 'Information is the key element to the logistics challenge'

BY JULIA KING

When Jim Reeder joined Commodore Business Machines, Inc. as vice president of customer satisfaction, the West Chester, Pa.-based computer company had a customer service record that ranked it next to last among 25 computer makers, Reeder says. "I used to get a lot of hate mail," he recalls.

Now, a little more than two years after outsourcing its customer service operation to Memphis-based Business Logistics Services, a division of Federal Express Corp., Reeder says Commodore boasts a 99% customer satisfaction record.

"Now I get a lot of letters saying Commodore really knows how to take care of its customers," he says.

Driven by a need to pare costs and focus resources on key business functions, Commodore is typical of the growing number of companies shedding costly functions such as customer support, transportation and inventory management.

King is a free-lance writer based in Ridley Park, Pa.

Instead, more and more savvy businesses are contracting with a new, fast-growing breed known as third-party logistics providers.

And — surprise — many of the more than 50 new logistics firms are spin-offs of large companies rich in technology assets such as global electronic data interchange (EDI) networks, imaging and bar-coding systems, expert systems and computerized inventory management applications.

"Information is the key element to the logistics challenge," says John Williford, president of Menlo Logistics, a Menlo Park, Calif., subsidiary of Consolidated Freightways, Inc.

During the last few years, dozens of large corporations have spun off for-profit logistics units, including Roadway, Inc., Caterpillar, Inc., TNT Transport Group, Inc., Carolina Freight Corp., Ryder Systems, Inc., Airborne Freight Corp., Associated Air Freight, Inc., Kaiser Aluminum Corp. and CSX Corp.

Regardless of their differing roots and services, the spin-offs share a common interest: leveraging hefty technology assets and logistics know-how into new revenue.

"Without information technology, there would

Continued on page 82



Technology
into dollars

KEY POINTS

► New computerized distribution services focus on tracking shipping, storage and delivery operations. Key targets include computer manufacturers, apparel companies and automakers.

► For IS, spinning off a distribution business often means new, challenging work, including integrating customer and in-house systems.

► AMR and CSX have unveiled a new OS/2-based worldwide logistics information management system aimed at large Fortune 100 companies. Beta testers include Procter & Gamble and DEC. See story page 83.

► Companies that have spun off commercial technology units during the last two decades have enjoyed mixed success. See story page 83.

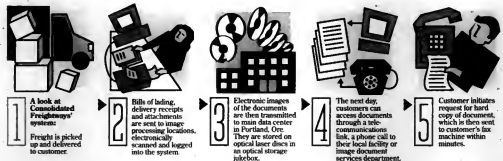
► **FAST FACT:** A North-eastern University study estimated that 37% of Fortune 500 companies now employ one or more third-party logistics providers.

QUOTEABLE:

"I used to get a lot of hate mail."

Jim Reeder
Commodore Business Machines

How computerized distribution systems work



Source: Consolidated Freightways, Inc.

CR: Chris/Stephanie Fischer

In a industry today, there's no doubt: it takes technology to keep track.

Little wonder that many companies are fashioning IS groups into commercial providers of distribution systems and similar services or creating new technology-driven units.

At the heart of today's logistics enterprises are sophisticated EDI networks. These often are coupled with state-of-the-art technology, such as integrated bar-code scanning systems and networked imaging systems that electronically track shipments and inventory.

Also key are software-based decision support tools for optimizing when, where and how products should be transported, stored and distributed.

These tools, plus nationwide and international networks, let logistics companies offer customers a single source for looking transportation services for

themselves and others. These services include tracking cargo shipments across carriers and through interstate commerce checkpoints, handling customer support functions and managing warehousing and inventory operations.

In turn, these third-party systems are linked to clients' financial and business applications. This enables customers to track all business processes—from order entry through product delivery and payment—from a single database record.

Cutting edge

Some logistics systems are on the cutting edge of technology. For example, Menlo Logistics, a Menlo Park, Calif., subsidiary of Consolidated Freightways, uses one of the trucking industry's first networked document imaging systems for tracking freight (see chart above).

Developed over a five-year period, the \$10 million system was rolled out last year to handle the mountains of documents that accompany the 75,000 shipments Consolidated Freightways handles each day.

The system is backed by a massive EDI network, over which nearly 30% of Consolidated Freightways' shipping transactions, including bills of lading and invoices, are processed.

Last year, the high percentage of computer-to-computer transactions earned Consolidated Freightways an EDI Association award for electronically linking to more of its trading partners than any other U.S. company.

Now, documents generated at the company's 950 terminals are collected at 48 regional centers where they are fed into scanning machines, then transmitted to a main data center in Portland, Ore., where they are permanently recorded on optical discs.

The new spin-offs

CONTINUED FROM PAGE 81

be no third-party logistics," declares Stephanie Schaefer, national account manager for customized logistics at North American Van Lines' High Value Products Division. "Investment in information technology is the cost of entering the logistics business."

Logical next step

Consultants agree that spinning off a logistics subsidiary is a natural for many companies invested heavily in hardware, software and networks to support their primary businesses.

"Information technology is clearly an area where companies look at outsourcing assets," notes Patrick Byrne, a vice president at A. T. Kearney, Inc., a management consulting company in Alexandria, Va.

The idea of parlaying technology into cash is nothing new. Dozens of companies set up computer services and outsourcing businesses in the 1980s. Many found the going tougher than expected, however (see story page 83).

The new wave of would-be service providers is zooming in on the more profitable business of handling distribution. Key targets include computer manufacturers, apparel companies, automobile makers and others looking to trim costs and improve by outsourcing noncore functions. It could be worth

the trouble.

According to some estimates, the third-party logistics market, now about \$6 billion a year, could hit \$25 billion by the end of the decade.

Business Logistics, for example, now boasts a customer base of 300 companies in 40 different industries. That's enough to account for an estimated 7% of FedEx's \$5.4 billion annual revenue.

Menlo Logistics landed a \$100 million contract to handle all transportation and distribution operations for Sears, Roebuck and Co.

"Most companies are clearly not interested in making any further information technology investment to handle logistics operations," says Michael Runnager, vice president of business development at End Logistics Dedicated Distribution, Inc., a Westerville, Ohio-based subsidiary of NFI International Holdings (U.S.A.), Inc.

Customers are interested in manufacturing and selling widgets," Runnager continues. "What we do via interfaces to their own systems is keep track of all the details—where the widgets



Business Logistics' May: Replacing 'traditional smokestack' approach to logistics

are, their condition, expiration dates and where they are manufactured."

According to a recent study by Northeastern University Professor Robert Lieb, 37% of Fortune 500 companies now employ one or more third-party logistics providers, primarily to handle warehousing and shipment consolidation.

During the next several years, consultants say, this percentage will climb even higher, as companies in every industry continue to focus in-house resources on revenue-producing activities.

In fact, Byrne estimates that some 60% of the \$581 billion U.S. companies now spend on logistics-related activities could be outsourced.

Early, sometimes spectacular, success stories are attracting eager information systems shops and service buyers alike.

At Commodore, for example, Reeder says 90% of customers' problems are now resolved in a single call to toll-free, 24-hour hot line staffed by Business Logistics employees.

There's also a powerful cost incentive, Reeder says. For Commodore to handle the tasks outsourced to Business Logistics would cost twice as much—with far poorer results.

Virtually all third-party providers say their bread and butter is furnishing real-time data that lets customers track shipping, storage and delivery operations through a single database record.

Cutting the strings

The new spin-offs share a curious, mixed relationship with corporate IS. Many tapped the IS talent of parent firms to get started, then built their own IS groups once things got rolling.

Caterpillar Logistics Services, Inc., for example, customized the heavy equipment maker's technology, explains Vice President Steve Wunning, who heads the 30-member staff at the unit, which was formed in 1987.

"We've taken Caterpillar's technology and reprogrammed it to meet our clients' needs," he says. Corporate IS

specialists are called in as needed.

Menlo Logistics has centralized IS at corporate headquarters, according to Willford. This arrangement places 500 IS staffers at his disposal. Some technology — primarily EDI capabilities, imaging and freight tracking — are also imported from Consolidated.

Starting from scratch

In contrast, the 80-person IS staff at Business Logistics built the firm's stand-alone system from the ground up, company President Robert May says. "This is not a case of repackaging existing services," he says. Business Logistics applications are linked to FedEx's transportation systems.

At Consolidated, for example, an internal system was expanded and customized by Consolidated's and Menlo Logistics' IS teams, then opened up to companies in other industries.

Willford says the arrangement lets Menlo Logistics customers access optimization modules and inventory management programs they never had before. He describes the service as "a very sophisticated inventory management system used by multiple customers."

Customers can now tap into Consolidated's full range of support functions, including centralized accounting, warehouse security and IS support.

Something for all

Individual services vary. Some third parties provide retailers and manufacturers with remote read-only access to their private databases to provide the instant data access required by just-in-



Willford's IS team at Menlo Logistics offers customers access to Consolidated's systems

time and quick-response programs. Others physically locate both hardware and software as well as personnel on a customer's premises.

Such arrangements create challenging new tasks for providers' internal IS groups. Among the biggest is seamlessly melding customer systems with in-house integrated logistics applications. The end result is that the provider's computer personnel become a sort of "shadow IS department" for the customer.

"In the end, we will look as much like a customer's information technology department as they want us to," Excel's

Runnager says.

Even in less radical cases, the simplest projects mean lots of extra work.

For example, the 80-member IS team at Business Logistics had to develop a single, integrated logistics application to replace what May describes as "the traditional smokesack or serial IS approach to logistics."

An expert-based system was created to track customer service calls and warehouse diagnostic data on all Commodore equipment. Customer management gets a daily computerized report of all help desk activities.

Custom software also had to be written to enable the system to combine customer service, order entry, finance, inventory accounting and distribution applications.

Moreover, Business Logistics' IS staff members also provide warehousing and transportation management and customer service support and maintain an integrated logistics database for each customer, so it can download data into its own corporate system.

Finally, a "parts bank" service lets small and midsize companies warehouse spare parts and other inventory, which can be dispatched anywhere in the world on a next-flight-out basis.

But least you be too impressed, beware: Just because logistics providers have well-known parents doesn't mean they are likely to see much of a few of those companies pulling cutesy needles out of their balance sheets.

"At least two-thirds of the companies that have attempted to turn IS into separate profit centers have failed to achieve their objectives," says Howard Anderson, managing director at Boston-based The Yankee Group. Others say that might be on the low side.

The old spin-offs

Making money with IS probably prickly but potentially profitable

BY MARK MEHLER

"I once knew a man who took off all his clothes and jumped in a mass of cactus. When I asked him why, he said, 'It seemed to be a good idea at the time.'"

Steve McQueen
The Magnificent Seven

During the last two decades, dozens of companies in every industry had what seemed like a good idea at the time: spin off information systems groups to compete in the commercial market for software and services.

It did sound tempting: Low investment, low risk, good business opportunity. TKW, Inc., Kimberly-Clark Corp., The Boeing Co., American Express Co., Block & Decker Corp., Nymex Corp., Martin Marietta Corp. and many others have taken the plunge. Their common dream: leveraging hard technology investments into viable commercial businesses.

Look around today, though, and you're likely to see more than a few of those companies pulling cutesy needles out of their balance sheets.

"At least two-thirds of the companies that have attempted to turn IS into separate profit centers have failed to achieve their objectives," says Howard Anderson, managing director at Boston-based The Yankee Group. Others say that might be on the low side.

Why no success?

The reasons for hard times and failure are many, according to IS managers and consultants (see chart page 84). Beyond a stagnant economy and huge cuts in defense spending, disappointing performance often boils down to the fact that spin-offs know more about technology than about business.

"Very few people running internal IS divisions think like independent business entrepreneurs," Anderson says. "They've been running sheltered workshops for years. They found out that competing in the outside market looks a lot easier from the inside."

Take Kimberly-Clark, for example. In the 1980s, the paper products maker spun off an outsourcing and consulting operation with a big splash. Earlier this month the company confirmed it has laid off most of its outsourcing/consulting staff and is looking to phase out of the business (CW, Aug. 10).

"They had unrealistic expectations of reaching \$100 million in revenue within four years," a source close to the operation said. "And even if they had reached that goal, they would have needed to get much larger to compete against the EDIs and IBMs of the world."

Aerospace/defense contractors, in particular, have also been scaling back. Continued on page 84

AMR and CSX shake hands on logistics deal

Anyone who doubts that distribution logistics is hot, consider the following: Two of the biggest names in transportation are racing hand in hand into the multibillion dollar industry.

Last month, AMR Corp. and CSX Corp. unveiled a new worldwide logistics information management system that partners hope will be bigger than American Airlines' fabled Sabre reservation system.

Known as Encompass, the new offering is touted as the first integrated, "multimodal" global trading system. The goal, according to John Stow, president of Cary, N.C.-based Encompass, is to give customers "a single window to all trading partners."

Stow says this is accomplished by linking a subscriber company's suppliers, customers and other logistics providers in a single, system-neutral interface.

The two giants joined forces in April, announcing the formation of the joint venture. Each partner reportedly invested "tens of millions of dollars" since 1986 in hopes of cashing in on the booming market. Today the combined staff consists of 99 full-time employees, including 80 information systems professionals.

Company officials say the network-based service is different enough to distinguish itself from competitors. "The basic difference between us and third-party logistics companies is that they are linked to a physical service they are providing," Stow says. "We are into building an information system where different companies can look into data and then make decisions based on that data."

Encompass is a sort of party line, Stow explains, con-

necting shippers, carriers, freight forwarders and consignees. They can then communicate directly with one another and monitor one another's activities.

During beta testing, for example, Procter & Gamble Co. detected certain routing delays over the Encompass system. So the company was able to redirect inventory from European warehouses rather than tap products stored in safety stock locations in Japan.

Besides Procter & Gamble, other beta testers include Digital Equipment Corp., a major pharmaceuticals firm, three major ocean carriers and three major forwarders.

Encompass has also been working closely with 16 other global shippers, 14 major carriers representing all transportation modes and 12 third parties, including brokers, forwarders and logistics management companies, Stow adds.

Eventually, he says, the Encompass partners envision that freight forwarders and Fortune 500 firms will use Encompass in much the same way that travel agents employ American Airlines' Sabre system.

Encompass uses a combination of off-the-shelf and proprietary software, consisting of a message bus and an applications translation server. The main workstation is an IBM-compatible personal computer using OS/2, operating in either stand-alone or server mode. Pricing varies and includes installation, setup, subscription and transaction fees.

JULIA KING

CSX

The old spin-offs: A mixed bag

CONTINUED FROM PAGE 83

or abandoning outside product and service activities. The following are a few examples:

• **Boeing Computer Services** left the commercial integration market in 1991 after failing to make much of a dent in that highly competitive niche.

Nonfederal business grew less than 2% last year, accounting for only about \$78 million of the unit's \$1.92 billion in revenue. Boeing Computer still accepts commercial work but is not actively seeking it, according to a company spokesman.

• **McDonnell Douglas Systems Integration Co. (MDSI)** has sold its entire commercial IS operation piece by piece, says William Jackson, director of computer services. The \$400 million unit was sold to Electronic Data Systems Corp. for \$199 million in November 1991. MDSI, Jackson explains, "felt it needed cash to return to its core aircraft business."

As for the company's Unigraphics computer-aided design (CAD) software, Jackson says that top MDSI management was simply unwilling to make needed investments in the product line.

In the end, analysts say that MDSI, like Kimberly-Clark, simply could not create a large outsourcing base to get the economies of scale needed to compete with EDS or IBM. "Information services were viewed as a distraction," Jackson says.

• **Black & Decker** postponed in May a previously announced public offering of shares for PRC Advanced Systems, citing "current conditions" in the initial public offerings market. Revenue for PRC, Inc., the McLean, Va., IS arm of Black & Decker, was down 1.5%, to \$688 million, in 1991.

• **TRW** announced in December that it would trim several arms of its

executives have gone on record saying that computer-related operations could be closed down entirely if no buyers are found by mid-1993.

• **Nynex's** IS operations suffered a 34% revenue drop last year, plunging from \$1.3 billion to \$861 million. Ongoing company efforts to focus on core businesses trimmed the company's software, services and distribution businesses.

Last June's sale of 77 Businesses, land, inc. centers to ComputerLand Corp. was a clear signal that the firm is dumping its low-margin hardware and distribution businesses in favor of software and services, including AGS Computers, Inc. Outsourcing and multimedia are seen as strong (and hopefully profitable) new directions.

Not all bad news

To be sure, there have been some notable successes among the IS spin-offs, observes Scott Polak, a program manager at G2 Research in Mountain View, Calif.

Andersen Consulting, the \$2 billion-plus integrator spun out of Arthur Andersen & Co. as an autonomous operation in 1988.

Lockheed Corp. enjoyed 25% revenue growth in 1991, thanks to roll-outs of new graphics, plotters and color printer products from CalComp, its \$525 million Anaheim, Calif., computer subsidiary.

Then there is General Electric Information Systems (GEIS), a GE business unit that focuses on elec-

tronic data interchange (EDI), mail and related applications. The unit began 28 years ago as a time-share outgrowth of GE's computer hardware business.

Art Hyder, manager of North American technical services, attributes GEIS' staying power in part because it reports directly to GE chairman Jack Welch.

"We are on the same level as NBC

or major appliances," Hyder says. "That is the only way to compete. You've got to be serious ... and you've got to be flexible enough to adapt to the changes in technology and ride out the economic cycles."

James Hazel, marketing manager at Du Pont Information Engineering Associates, a computer-aided software engineering (CASE) vendor in Wilmington, Del., concurs fully.

Du Pont, which began offering commercial products and services

computer time and network outsourcing services in 1988. Its revenue is roughly half of what the company had hoped for, acknowledges Randall Gannaway, director of information resources, operations and technology.

He attributes the results to a long learning curve. "We are only just beginning to figure out how to price and market our services," he says.

But FMC, which targets small outsourcing engagements in the Dallas-Fort Worth area, still has hopes that its "home-style" service approach to the commercial market will eventually yield big payoffs.

• **Martin Marietta** is also hanging on. Last year, the Bethesda, Md.-based firm folded its commercial IS business into a Florida-based missiles and electronic group. The move seemed to work: In 1991, the unit enjoyed a modest 2% revenue increase, to about \$560 million.

Large contracts with the U.S. Postal Service and the Department of Housing and Urban Development, a strong defense presence plus a healthy outsourcing business seem to bode well.

• **Weyerhaeuser Co.**, a large lumber company, similarly reports mixed results in its commercial IS program.

In spinning out Weyerhaeuser Information Systems in 1985, the parent company had two aims: diversify its product line and create a management model that would make the systems arm a more effective supplier to internal customers.

Susan Mersereau, formerly vice president of MIS, says Weyerhaeuser still offers commercial disaster recovery services in partnership with systems vendors. But the firm began backing out of the software business a few years ago.

"There was never a strategy to [achieve] a leadership position in software," explains Mersereau, who has been reassigned as a vice president in the total quality program. "Management underestimated what it takes to sustain such a product line. It never succeeded in becoming a core business here."

Mersereau adds, however, that while the product diversification strategy may not have worked out, Weyerhaeuser did achieve its second key goal.

"We've greatly improved our internal customer focus, and now we understand our cost structure," she says. "Our core processes, project and change management, billing and invoicing, had been loose ... We streamlined and tightened them up. If [management] had the whole thing to do over, [we] do it again." •

Mehler is a free-lance business and technology writer based in Jackson Heights, N.Y.



Weyerhaeuser's Mersereau: 'If [management] had the whole thing to do over, [we] would do it again.'

five years ago, is only a \$20 million business that has yet to achieve sustained profitability.

However, Hazel says parent Du Pont Co. understands that building an integration infrastructure to compete one day with EDS or Andersen Consulting is a long-term task.

"Management understands the nature of start-up businesses," he says. "Quite often, companies have [expectations for IS start-ups] that are too grandiose."

Du Pont offers rapid application development using advanced CASE tools and consults on design methodologies in the Digital Equipment Corp. and IBM worlds. More recently, it has expanded into executive information systems.

Even though the unit does not receive huge sums for marketing from its parent, Hazel says he is not worried. Systems integration is primarily a referral business, he contends. "Customers know Du Pont's overall reputation for quality."

Mixed results

The majority of companies that have spun out information technology as a strategic business report results that fall somewhere between a smashing success and abject failure.

While many companies haven't met initial objectives, they have not given up either.

• **FMC Corp.**, a Dallas-based financial services firm, began selling com-

Why spin-offs fail

Many promising technology-driven ventures go belly-up because, according to consultants, they fail to recognize these major pitfalls:

Lack of a hard edge needed to compete outside company walls.

Compensation packages too low to attract top talent from major competitors.

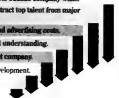
Failure to focus in high marketing and advertising costs.

Lack of top management support and understanding.

Overreliance on business from parent company.

Underestimating cost of software development.

Overhead too high.



Source: The Venture Group

CH Chart: Stephen Kuehler

\$1.95 billion Information Systems and Services Group, including computer maintenance, real estate processing, and receivables management. Moreover, half of a \$365 million fourth-quarter charge was chalked up to technology.

Overall, the company's IS operations lost \$138 million in 1991, a far cry from the \$49 million profit earned the previous year. Company

tronic data interchange (EDI), mail and related applications.

The unit began 28 years ago as a time-share outgrowth of GE's computer hardware business.

Art Hyder, manager of North American technical services, attributes GEIS' staying power in part because it reports directly to GE chairman Jack Welch.

"We are on the same level as NBC

IN DEPTH

Putting estimates on track

Companies are plagued by poor project cost estimating, a recent study found. What follows are some tips on how to do it right.

BY ALBERT L. LEDERER
and JAYESH PRASAD

There is something very scary going on in companies today: Technology cost estimates are missing their marks. And we're not talking about isolated cases. Our recent study of 115 organizations found that cost estimates for more than three-fourths of the respondents' major projects were off. In 63% of those instances, companies said the projects came in "significantly" over budget.

The big, widely reported gaffes get all the play—like the \$8 million estimate at Allstate Life Insurance Co. that turned into a \$100 million system or a state of Oklahoma project estimated at half a million dollars and completed at a cost of \$4 million. But the fact that more than half the companies we studied had overruns means that disasters, no matter what their size, are happening quietly but consistently.

"People are being fired, and organizations are outsourcing applications development" in response, says Naomi Lee Bloom, managing partner at Bloom and Wallace, a Fairfax, Va., consulting firm. "Top management is fed up with projects that don't deliver as promised."

Skewed cost estimates don't just damage a project leader's career aspirations and lighten company coffers. The ramifications go even deeper.

According to survey respondents, cost estimating is used to figure out staff numbers for projects, to control project implementation, to select and schedule projects and to quote charges to users (see story page 87). If there is some fundamental flaw in a company's cost estimating process, that flaw is going to run through more than just one isolated project—a lot more.

Why is the situation so bad? Because users make changes, people don't communicate, staff relies on early estimates and managers don't monitor what's going on.

The thing every-

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Cindy Parrish

one wants to know is how to put together and manage a cost estimate. The following guidelines, gathered from what survey respondents said they did right and what they did wrong, might be just the ticket:

The problem here is critical: The developers are working "blind"; they don't know how the estimator arrived at the numbers. There is "a loss of the project's oral history, including how and why initial estimates were crafted," Bloom says.

A more subtle problem with split responsibility is that it may actually *foster* poor estimation and obscure who's at fault. The initial estimator—who doesn't analyze, design or program—has little pressure to be accurate. If there is an overrun, the estimator can claim that the developers were inaccurate.

The more savvy way to handle the situation is to have those analysts and programmers who will develop the system prepare an initial cost estimate during their feasibility study, when they are ascertaining user requirements. There will not be any miscommunication between estimator and developer.

Continued on page 86

Meet the participants

The 115 companies in the Lederer—Prasad survey shake out as follows:

Manufacturing.....	32%
Insurance.....	17%
Banking/Finance.....	10%
Systems consulting ..	9%
Government.....	6%
Utilities.....	5%
Retail.....	5%
Education.....	4%
Other.....	12%

Assign the initial estimating task to the final developers. There was a high correlation in the study between companies with cost overruns and the use of different people to estimate and program systems. For these firms, the analyst who prepared the initial cost estimate handed it over to another staffer for development.

Continued from page 85

because they will be one and the same person. Developers, who would be intrinsically involved from estimation to implementation, would be alert to poor user requirement reporting that could result in unreasonably low estimates.

An added bonus is that the process builds commitment. The analysts and programmers who perform the estimates cannot attribute overruns to somebody else's mistake. Allen Bellows, manager of planning yard systems at Bath Iron Works Corp., a shipbuilding company in Bath, Maine, says his estimators were the same people who developed the company's fleet maintenance planning application, which came in within budget and on time at about three man-years. "Developers were more committed because they developed the schedule. Their credibility was at stake," Bellows says.

Delay finalizing the initial estimate until the end of a thorough study. Perception is partly to blame for a poor estimate. The fact is that most projects go through various reestimates to arrive at a final cost figure, but management and users typically remember only the first estimate. They "tend to lock in on the low number," says Martin LaBrecque, information systems vice president of the automotive sector at Allied-Signal, Inc. in Morristown, N.J.

Even though there may be pressure

The estimate ills

Our 115 companies reveal the Top 5 incidents during that plague their estimating efforts

Changepotholes

Users frequently request changes.

Forgetfuls

Overlooked tasks.

Requirements amnesia

Users lack understanding of their requirements.

Miscommunication syndrome

Insufficient user and analyst communication and understanding.

Vague's disease

Poor or imprecise problem definition.

Source: Albert L. Lendrevy, Jayant Prasad

from business management ("I'm routinely asked for estimates with little time to think about them," LaBrecque acknowledges), it is imperative to delay announcing the estimate until it is as accurate as possible.

The first rule is not to hurt out an incomplete guess. The second is to get ap-

proval for a feasibility study, which will uncover costs to make the estimate more realistic.

The study should zero in on labor costs needed to analyze, design, code and test. Also, include initial testing costs and the money needed for the test reveals the need for modifications to initial requirements. Don't forget about screens and reports for users, inputs, permanent files and files tied into other systems.

Anticipate and control user changes.

The 115 companies in our study rated user changes as the "cause most responsible for inaccurate cost estimates." These changes are sometimes so numerous that a final system may look nothing like the one originally proposed—the one used as the basis for a cost estimate. Sixty-three percent of all projects in the study had to be revised in response to changed requirements.

Such a moving target makes it tough to plan costs, but companies can fight back by anticipating the frequency or extent of potential changes. "Knowing the business functions of the users is the best way of anticipating future requests," says Charlie Buden, project manager at Dayton Power and Light Co., a utility in Ohio.

That entails finding out why users do things and asking how they expect their business environment (their job, the company, the industry, competitors, vendors) to change. Are there new laws in their in-

dustry that might change the way they work?

Developers must communicate openly with users, helping them define their business problems and ferreting out any overlooked tasks, such as a screen or report that needs producing. Techniques such as prototyping, use of computer-aided software engineering tools and so on can help here.

Another tactic is to discourage unnecessary user changes that will ultimately invalidate an estimate. At Dayton Power, for instance, changes to a project require executive approval, Buden says. It is important to note, however, that the emphasis is on "unnecessary" changes—those nice-to-haves unrelated to vital areas such as usability or security. It is very important that developers and users together define what constitutes necessary changes beforehand.

Monitor the progress of the proposed project. Seven of every 10 of the large projects in our study had in place a formal monitoring process, such as milestones, so managers could keep estimate and project costs in line. Eight percent of them used an independent auditor to keep tabs on the project's progress. This person could typically come from a separate department such as accounting or auditing or could simply be someone not associated with the development of the project.

"We almost always have a user project

How object orientation can help project management

BY ALEXANDER M. STEWART

As development projects become larger and more complex, overruns in both budgets and schedules have become commonplace. It seems that management's reflex response to a project plan is to estimate how much overrun it can tolerate.

One of the problems with most project management plans is that they are developed from scratch. Instead of drawing on a library of historical experience, the project planner has only his experience and a few principles with which to work. Schedules are often based on too much optimism.

This kind of thinking may not have to be the norm forever. Borrowing the object-oriented paradigm from software development and applying it to project management can provide the basis for a more uniform approach to collecting and utilizing historical development experience on a widespread basis.

The first steps

While the object-oriented paradigm is still in its infancy, companies can keep it in mind as a future framework for communicating project experience from one project to another. In the best of all worlds, companies will set up an experience database in the form of an object (experience) library.

Every project consists of four phases: requirements, design, implementation

and verification. In object-oriented terms, each of these phases would be represented as "activity objects." Each of these objects can be broken down into more detailed activity objects (tasks) that are conceptually the same as objects in the layer above them (see chart). Instead of looking at phases and tasks as unique, companies can stress the commonality in them.

In large complex projects, this decom-

position process continues until the task size is small enough so a task can be performed in a reasonably short time period—say two weeks. Every task, down to the minute, continues to have requirements, design, implementation and verification activities.

Attributes, such as cost, schedule and status, are what differentiate one task from another. The value of an external attribute depends on the size and complexity of the task. The relationship between attributes and size/complexity has to be based on experience.

In the experience library, each activity object would be a conglomerate of the results of several development projects employing the same type of activity object. Each activity object would have to be rigorously described; in this way, it becomes easy for developers to search the experience library for objects that can be useful for a current project.

Examples of what might be in a library include a structured analysis task for a subscriber database or an object-oriented design task for an airplane brake control system.

In keeping with the object-oriented paradigm, each activity task (or phase) in a project has a set of external attributes. The

For example, the cost and schedule attributes for a particular activity task are projections based on the experience of similar tasks in previous projects. When the task is complete, what it cost, how long it took to complete and how many problems developers discovered are values added to an experience database.

Reliability issues

To develop a reliable relationship between attributes and size/complexity, a company must collect metrics over a wide range of projects. Defining a uniform set of metrics and formally collecting them are critical components of making the object-oriented paradigm work.

Another possible category of objects in a project are work product objects. A work product is the physical result of an activity—the requirements document you hold in your hand or the software that runs on a computer. It comes into existence at the completion of the verification activity and can be modified later by an appropriate activity, such as a requirements or design task.

Like activity objects, work product objects have a type (unique library description) and external attributes. The external attributes would be title, type (such as document or code), state and version.

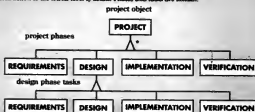
The experience library would contain prototypes of object classes (activity, product, etc.). A project planner could go in the library and select prototypes, using them as a basis for what he develops.

The planner could then spend analysis time only on tasks that involve new methodologies or techniques.

Because the objects be selected are based on experience, not speculation or gut-feeling estimating, his project will have dependable costs and schedules. Products will be of a higher quality as a result of his not shying on essential parts of the development process, such as requirements analysis and adequate testing. *

Where 'phases' and 'activities' overlap

This diagram shows that there is a continuity of concept from the highest level of abstraction to the lowest level of detail. Phases and tasks are similar



* The Δ symbol can be read as "the box at the top of the diagram contains each of the boxes on the row below it." In this case, a project object contains requirements, design, implementation and verification activities.

Source: Alexander Stewart

OW Chart: Janet Gorenberg

Stewart is a software development consultant at Koral Associates, Inc. in Los Angeles.

manager who conducts project review meetings assessing schedule and budget, controlling the project's scope and authorizing changes," LaBrecque says.

American Management Systems, Inc. in Arlington, Va., uses three or four independent auditors for each of its projects, says Fred Forman, executive vice president at the company. The input of these auditors during a retail credit system project for hundreds of sites averted what could have been an "unpleasant situation," Forman says. The auditors pinpointed certain problematic parts of the plan, including how long the project would take and how much support it would need, so the estimates for the eight-figure project were more realistic.

Stringent, formal monitoring keeps developers on their toes as they strive to complete the project within the parameters of the estimate. Furthermore, knowing that managers will be following the project's and estimate's every move inspires great diligence and accuracy in the creation of the estimate.

Computing management should carefully study and approve the cost estimate. Even the best estimators make mis-

takes. That's why IS managers should study and approve the cost estimate rather than relying completely on the skills of estimators. Besides, having the department head involved probably increases the chances of a solid estimate. The study found a statistically significant correlation between the projects in which IS management signs off and more accurate estimating.

"In 1988, Ford implemented a life cycle methodology that incorporates management reviews of estimates to increase their accuracy," says Rich Wojcik, manager of corporate technical planning at Ford Motor Co.

Rely on documented facts, standards and simple arithmetic formulas rather

than guesses, intuition and personal memory. According to our study, there is a high correlation between accurate estimates and the use of documented facts, a simple formula and established standards. (See page 86 for a look at how an object-oriented paradigm and its idea of capturing and reusing experiences can be applied to project management.)

Don't rely solely on cost estimating software. Only 17% of our companies reported using a software package to help estimate the development costs of their large projects. We found that users of such packages were no more accurate in their estimates than were nonusers.

One cynic put the use of an estimating package this way: "First you come up with an estimate that you know management

will accept, probably basing it on the amount of money the user has to spend. Then you follow the rules of the package to estimate the actual costs. That means taking a guess at parameters.

"If the software package produces an estimate that is too high, reduce the parameters to lower the estimate to the number you wanted in the first place. If the package produces an estimate that is too low, increase the parameters until you get the estimate you originally wanted. Management will be very impressed by the computer printout from the software-generated estimate, and that by itself may get the project approved. Don't worry about implementing the system within the estimate—let the programmers worry about that." ■

Bad estimates' ripple effect

Cost estimating encompasses much more than just how much one large project is going to cost. That's why it is so critical to be accurate.

Here's how it is used to figure out staff numbers for projects, to control project implementation, to select and schedule projects and to quote charges to users.

•**Staffing:** A cost estimate typically includes the expected number of hours needed to complete a project (e.g., 4,500). A company has a standard number of productive hours for employees (e.g., 1,800 hours per year). Management decides when it wants the project finished (say in 6 months, or 900 hours). If you divide the project hours (4,500) by the man-hours to completion (900), you come up with the number of people—five—needed for the period.

•**Control:** In terms of project implementation, most people use hours from the estimate associated with particular, tangible accomplishments (milestones), counting hours until milestones are accomplished. If accomplishments begin to take more hours than planned, you take action (maybe revise the estimate, replace some people on the project team, etc.).

•**Selecting and scheduling:** Management contrasts the estimated number of hours required with the number of hours individual analysts and programmers have available so it can assign projects to available people.

•**Quoting charges:** The estimate is a dollar cost figure that information systems management might directly charge to users.

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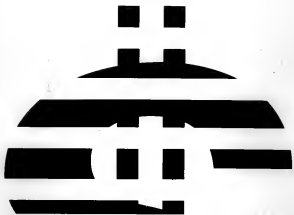
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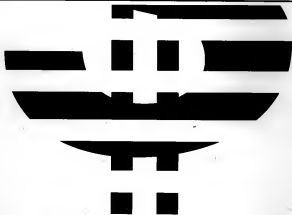
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MANAGER'S JOURNAL

EXECUTIVE TRACK



The Associated Group, an insurance and financial services company based in Indianapolis, recently named Michael L. Wright its senior vice president and chief information officer.

Before joining Associated four years ago, Wright served as executive vice president and chief operating officer of Baltimore-based American Health and Life Insurance Co. Prior to taking on his current CIO post, he was president and chief operating officer of Anthem Life Insurance Co., an Associated subsidiary group.

Thirty-eight year Sears, Roebuck and Co. veteran Charles A. Carlson, president of Sears Technology Services, Inc. (STS), will retire within the next several months, as soon as the transition of STS to the newly formed Sears/IBM network outsourcing joint venture Advantia has been successfully accomplished.

The advent of Advantia was announced last week; the company is expected to be up and running by the end of the year, according to its founders. Carlson, who has served as president of STS since its founding in early 1990, is credited with helping to spearhead the new joint venture.

The Washington, D.C.-based Urban & Regional Information Systems Association (URISA) recently elected Laurel McKay as its new president and announced three new board members: Nora Sherwood Bryan, Peter Crosswell and Anne Hale.

McKay is currently director of the development of Alberta, Canada's Land-Related Information System. Sherwood Bryan is information technology group manager at Ernst & Young. Crosswell, a consultant, now chairs the URISA Standards Committee, and Hale serves as director of geographic information systems and technology development at the South Carolina Water Resources Commission.

Security that's certifiably good

Seeking to lift profile of security pros, groups push to provide certification procedure

BY JAMES DALY
CIW STAFF

What do the following people have in common: systems software specialist, internal auditor, chief of data management, head of software development, chief of communications management, network administrator and systems analyst?

Answer: They are all in charge of computer security.

Surprised? Don't be. The jumble of titles highlights the fact that data security is often considered an afterthought at many organizations — a responsibility tacked onto other responsibilities.

Not an afterthought

That is a dangerous attitude, says Richard Koenig, an independent security consultant who now heads the International Information Systems Security Certification Consortium, Inc. (IS3C), a nonprofit group pushing to provide the first specialized professional certification in the "infosecurity" field.

"Computer security is a very specialized art, but at many places it's treated as an afterthought," says Koenig, president of the Spencer, Mass.-based group. Adds Philip Chappick, director of the Computer Security Institute in San Francisco: "A lot of people stumble into information security with no training. The company gets dinged on an audit and they quickly assign someone to do security."

IS3C was founded in 1989 by representatives of several professional organizations in conjunction with companies looking to easily identify individuals well-qualified for the task of resolving current and future information security issues.

"We need to quickly find people who we know can do the job, who know what they are talking about and can handle themselves well," says Hal Tipton, director of computer security at Rockwell International Corp. in Seal Beach, Calif., and vice president of IS3C.

Koenig says IS3C is in the final stages of creating an examination for its Certified Information Systems Security Professional designation and hopes to hold the first tests next spring. The group will also hold training classes to prepare hopeful candidates for the test.

To get the certification program started quickly as well as to underwrite test development, IS3C directors set up an initial process whereby applicants can submit evidence of professional experience and qualifications to a review committee. Such qualifications include

eight years in the data security field, with at least one year spent in four of the 17 areas in which IS3C hopes to offer specializations: physical security, access control and cryptography, to name a few.

Under this "waiver of formal examination" process, approved applicants will be certified without having to take the exam, Koenig says. They will, however, need to pay the \$350 test fee.

After the initial cycle, Koenig says, he hopes his group will certify more than 1,000 people a year.

Koenig says the certification process is intended to be "a starting point," not a Superman designation.

Let's get quizzical

IS3C security certificate hopefuls confront questions such as the following: 1.

1. Who does David Kahn credit as the father of modern cryptography?

- a. Genghis Kahn.
- b. Knutsky.
- c. Daniel.
- d. Gorn.
- e. Leon Battista Alberti.
- f. Reverend Blake Greenlee.

2. The strength of a cryptographic key is usually described by:

- a. Multiplying the key length by frequency of change.
- b. Dividing the number of possible keys by two.
- c. Summing the key space.
- d. Calculating the third harmonic of the key shift.
- e. Calculating the coefficient of stochastic variance.
- f. Subtracting the weak keys from the total key space.

3. Which of the following weakens the effectiveness of a password?

- a. Increasing the number of password attempts.
- b. Increasing the length of a password.
- c. Increasing the size of the permissible character set.
- d. Encrypting the password for transmission.
- e. Encrypting the password for storage.
- f. Masking the password or using a nondisplay field.

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Source: IS3C Group

CIW Credit: Michael Spigno

"It's not perfect," he says. "The certificate will be a measure of knowledge vs. the ability to apply it." Continuing education is built into the plan, he adds. Certified professionals will have to be recertified approximately every three years by taking a test dealing with new developments in the field.

Testing 1-2-3

The IS3C certification examination will consist of two parts: a core main review that evaluates an applicant's understanding of general information security practices and principles, and a number of specialty tests that will provide in-depth evaluation of specific areas of security.

What are the benefits of certification? Koenig named several:

- The specialty tests will be able to identify applicants who have specific expertise, allowing organizations to streamline the process of job assignment and quickly assemble a security staff fully tuned to protect information in their specific environment, he said.

- Companies required to demonstrate a certain level of security proficiency in order to meet legislative or regulatory requirements will be able to certify that they have personnel who meet the criteria dictated.

- Additionally, "the qualifications of applicants can be assessed based on their achieving professional certification, rather than their ability to write a convincing resume," Koenig said.

Solid measure?

Good intentions notwithstanding, some users remain skeptical of the need for a certificate. "I know a lot of people who can't take a test worth a darn, but [what are the best folks to have in the trenches when you're fighting a security problem]," says Dennis Evans, a systems analyst in charge of network security at the Illinois Department of Revenue in Springfield.

Others say the certification process may provide a good foundation but warn against using it as a crutch.

"There is no substitute for real-world experience," says David Stang, chairman of the International Computer Security Association in Washington, D.C. "Continuing education needs to be heavily emphasized. I would hate to see us end up with a bunch of narrow specialists within the computer security discipline."

IS3C is not the only group to come up with the idea of standardizing data security training. Similar certifications are already offered by two other groups, although neither offers the degree of concentration on data security that IS3C promises.

The Institute for Certification of Computer Professionals in Des Plaines, Ill., does not focus directly on the information security function but does offer a subspecialization in its Certified Computer Programmer, Certified Data Processor and Certified Systems Professional designations.

Other organizations are also moving to provide a base of common knowledge to train future security professionals. The Computer Information Systems faculty at the University of Idaho, for instance, has developed an eight-step sample curriculum for teaching information security to students.

Bank CIOs defend their systems strategies

BY THOMAS HOFFMAN
CIJ STAFF

Information systems executives at a few major U.S. banks have taken exception to the findings of a recent report that shows the banking industry still mired in the technological stone age despite huge dollar investments in information technology.

The 1992 survey of technology was issued by New York-based market research firm Ernst & Young in conjunction with trade newspaper *American Banker* and was based on responses from chief technology executives at 68 of the nation's 300 largest banks. It drew a bleak picture of banks stagnating through an outdated, mainframe-heavy technology landscape, \$14.1 billion worth of 1991 technology investment notwithstanding.

What we are seeing is the commercial legacy of the banks' technology legacy, Ernst & Young banking partner Diego Teixeira said. Most, if not all, of the survey respondents continue to use outdated legacy mainframe systems to run more than 80% of their applications, he said, with a resulting drain on profitability.

But IS executives at several banks characterized their institu-

tions as heirs, rather than victims, of legacy systems.

David A. Moore, senior vice president of information processing at Mellon Bank Corp. in Pittsburgh, said he believes alternate computing platforms, such as client/server-based or distributed computing environments, have not yet matured to the level required to process corporate-strength applications.

For example, Moore pointed out, major banks typically process between 4 million and 8 million checks per day. Only a mainframe, he said, can satisfy such number-crunching demand.

"The capabilities for high-volume transaction processing, reliability, security and connectivity needs for commercial banks can only be met with large mainframes," said Anish Mathai, vice president of technology strategic planning at Bankers Trust Co. in New York.

Ernst & Young's research shows that only a handful of banks have deployed leading-edge technologies such as check image processing and expert systems, Teixeira noted. On a scale of 100, the highest score the survey logged for any respondent bank in terms of technological advancement was 39. Teixeira declined to disclose the high score, but he said that many banks had scores close to zero.

Moore disputed the significance of such findings. "Check image processing has not evolved to the point where any bank has utilized it fully," he said. Mellon has been using FileNet Corp.'s file folder imaging system for nine years with good results, Moore said. The bank has also been testing IBM's check imaging systems for the past three years.

Many banks are in fact using leading-edge technologies to support their data centers, according to Teixeira. For example, he said, quite a few have been

aggressive in updating their disk-access storage device technologies. Some use sophisticated on-line networks to support their telecommunications requirements, he added.

But these are the exceptions.

The rule remains technological catch-up at the banks. For example, few banks reported wide use of groupware, or software that is used to coordinate activities among multiple group members. The Chase Manhattan Bank N.A. in New York has been an early proponent of Lotus Development Corp.'s Notes groupware, but Teixeira said the \$97 billion bank is an exception among its competitors. Only 6% of the banks surveyed are widely using groupware, he said.

Waiting for advances
Mathai said that although he expects the use of groupware "to explode" throughout the banking industry over the next few years, he believes most banks are waiting for the technology to ripen.

Although the industry is using 766,000 microcomputers — a 19% increase from 644,000 last year — only 37% of the banks have local-area networks, Teixeira said. The number of distributed computing systems is expected to grow from only 4% of the installed base to-

day to 11% in 1995.

Barnett Banks, Inc., the nation's 18th largest bank in terms of assets, is moving aggressively to migrate many of its mainframe-based applications onto client/server environments, according to Jonathan Palmer, chief information officer at the Jacksonville, Fla.-based bank. Palmer said Barnett has roughly 700 LANs throughout its operations, most of them based on Token Ring or Ethernet.

But at the same time, the bank is also migrating many of its mainframe applications from one box to another where they are most cost-effective, said Palmer, who is also chairman and chief

executive officer of Barnett's information technology subsidiary Barnett Technologies, Inc.

"We need the storage, the data transfer and the processing power that the mainframe brings to bear," Palmer said.

Surprisingly, electronic-mail applications are being widely used by a mere 23% of the banking industry, according to the survey. Although the technology has been available for more than a decade, Teixeira said, "only a fraction of the banks are using it regularly." But Moore and Mathai said their organizations were among that fraction. Palmer agreed that E-mail can be used more effectively. However, he added, banks do not deserve to be singled out. "E-mail is a tool that's certainly not being used to its fullest capabilities by any industry," he said.

Moving away from the mainframe

The mainframe will still be used more than any other platform, but it is also the only platform to regress



Source: Ernst & Young/American Banker

CIJ Chart: Michael Taggart

CALENDAR

SEPT. 6-12

Banking Technology Computer Conference and Exposition, Denver, Sept. 6-10 — Contact: National Trade Publications, Inc., Alexandria, Va. (703) 683-6500.

SEPT. 13-19

Software Development Conference and Seminar '92, Boston, Sept. 13-18 — Contact: Miller Freeman Publications, San Francisco, Calif. (415) 993-2741.

Boscon '92/Boscon Boston, Sept. 15-17 — Contact: Boscon '92, Norwalk, Conn. (203) 852-0508.

DOO-STD Conference, Washington, D.C., Sept. 15-17 — Contact: David Maher Associates, Inc., Norwalk, Conn. (203) 449-4054.

Coyote Ball '92, San Diego, Sept. 17-19 — Contact: Acornco, San Diego, Calif. (619) 449-7228.

DevCon '92, Phoenix, Sept. 18-23 — Contact: Microsoft Press, Inc., Portland, Ore. (503) 697-4344.

SEPT. 20-26

Suppliers '92, Orlando, Fla., Sept. 20-23 — Contact: Spira Bureau, S.A.P. Canada, North York, Ontario, (416) 225-0074.

Pen-Based Expo, Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (603) 947-3846.

Image World, New York, Sept. 21-25 — Contact: Benta Business Knowledge Publishing Publications, Inc., White Plains, New York (914) 326-9157.

Virtual Reality '92, Worcester, Mass., Sept. 23-25 — Contact: Mclennan Conference Management, Worcester, Mass. (508) 238-4967.

The 19th Annual New England Computer Operations Conference, South Portland, Mass., Sept. 24-25 — Contact: Jeanette Leriche, Personnel/Event Support, Portsmouth, N.H. (207) 436-2815.

SEPT. 27-OCT. 3

Seniors Expo '92, Chicago, Sept. 27-30 — Contact: Expocon Management Associates, Inc., Thornhill, Ontario (416) 374-1411.

The Sixth Annual Strategic Issues Conference and Chief Forum, La Jolla, Calif.

Sept. 29 — Contact: Computer Intelligence, Santa Clara, Calif. (408) 980-4300.

CASA World Conference & Exhibition, Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (603) 470-3888.

CD-ROM Expo '92, Boston, Sept. 30-Oct. 2 — Contact: Michel Hal Associates, Dedham, Mass. (617) 381-2001.

Software Publishers Association (SPA) Annual Conference, Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 462-1860.

Graphic Expo East '92, New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Boston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference, New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 846-0523.

Repository Ad/Cycle International Users Group Conference, Chicago, Oct. 4-7 — Contact: Repository Ad/Cycle Group, Santa Monica, Calif. (310) 394-8205.

Electronic Data Interchange Association (EDI) Annual Conference, Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 630-6642.

Scan-Tech '92, Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8548.

OCT. 11-17

Network '92, Dallas, Oct. 12-15 — Contact: Kable Press, Norwalk, Conn. (203) 944-1400.

InfoTech Management '92, Nashville, Oct. 18-21 — Contact: Data Processing Management, Park Ridge, Ill. (708) 655-8124.

Slalom '92 Conference and Exhibition, New Orleans, Oct. 18-21 — Contact: National Retail Federation Division, New York, N.Y. (212) 344-4760.

Society of Information Management (SIM) 1992 Annual Conference, Universal City, Calif., Oct. 18-21 — Contact: SIM headquarters, Chicago, Ill. (800) 477-5282.

ANPS Conference and Exhibition, Houston, Oct. 18-23 — Contact: The Educational Society for Resource Management, Pahrump, Nev. (702) 297-0244.

OCT. 23-31

The 13th Annual Technology Management Conference, San Diego, Oct. 25-28 — Contact: Treasury Management Association, Baltimore, Md. (301) 997-3962.

AES Annual Meeting, Pittsburgh, Oct. 28-29 — Contact: Richard B. Hill, AES, Silver Spring, Md. (301) 495-0900.

Total Quality Management (TQM) '92 Conference and Exhibition, Chicago, Oct. 27-28 — Contact: The Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1560.

Outsourcing the Help Desk Conference, Colorado Springs, Oct. 27-30 — Contact: Help Desk Institute, Colorado Springs, Colo. (303) 581-8338.

Boscon '92, Baltimore, Oct. 28-31 — Contact: National Trade Publications, Inc., Alexandria, Va. (703) 683-6500.

Europe Caravan Chicago, Irving, Calif., Oct. 30-Nov. 4 — Contact: Wendy King, J. Kruger Associates, Hong Kong. (917) 577-5443.

NOV. 8-14

United States Society of Wang Users (USSWU), Boston, Nov. 9-13 — Contact: USSWU, Chicago, Ill. (708) 655-3885.

15th Annual Eastern Association for Information Systems (EAIS) Computer Users Conference, Lake Huron, Pa., Nov. 12-13 — Contact: Fresh Waters, Titusville, Fla. (321) 675-7394, Ext. 216.

Synergy '92, Anaheim, Calif., Nov. 9-13 — Contact: Norgren Publications, Inc., Boston, Mass. (617) 543-0444.



Before You Get Benchmarks, GET ANSWERS

You need a new workstation. But there are so many on the market. How do you decide? Ask the right questions. Then, choose the right benchmarks.

3 If you're planning to purchase a new workstation and you need some vital information to help you make the right choice. You need to find out whether System X can handle your particular application; well enough to satisfy your business requirements and whether it's a better value than System Y. Ideally, this information would come from a direct comparison of the competing systems running your application under exactly the same conditions — a situation that's costly and not very likely to occur.

When you can't do side-by-side comparisons of actual applications, the next best information provider is the benchmark. Benchmarks measure everything from CPU to memory to I/O subsystems and more. That's why it's up to you to choose the particular benchmarks that relate directly to your system's applications. Choosing the wrong benchmarks can be a waste of time and money. In the end, you may be misled into selecting a system that cannot do the job according to your requirements.

The Initial Step:

Answering Two Questions

As you prepare to select the appropriate benchmarks, be sure to answer these questions first: What are you trying to measure? And, what is important to your application?

To answer these, first visualize your application on a generic system in your environment. This generic system consists of eight basic components, including:

- Central processor
- Floating-point processor
- I/O subsystems
- Memory
- Integer and logical ALU (Arithmetic Logical Unit)
- Network interface
- Operating system (utilities, compilers, databases)
- Graphics (for workstations).

Overall performance is determined by the interaction of these components with your application. Therefore, in determining what's important to measure, weigh these components according to your application's use or dependency on each. The next step is to identify the benchmarks that measure the components most utilized by your application.

Major Benchmarks: What They Measure

Of the major industry-standard benchmarks, the following are likely to be your best sources of information prior to a system purchase. Most vendors will provide you with specific results of these on their own platforms.

SPECint92 and SPECfp92 (Standard Performance Evaluation Corporation)

Having replaced the original SPECmark, these measure processor speed, memory bandwidth, and compiler effectiveness.

SPECint92 is a set of 6 integer C programs. **SPECfp92** is a set of 9 dp floating-point FORTRAN, 3 sp floating-point FORTRAN, and 2 sp C programs.

ADM II

This benchmark measures integer and floating-point, I/O transfers, OS-function and system calls, disk access, and data transfer over a UNIX pipe.

ADM III

Measuring CPU, floating-point, I/O, memory, integer, and some system functions. ADM III can be used to compare relative performance of multiter UNIX systems and can be customized for capacity planning. (Metric: AIM Performance Rating, Maximum User Load)

ADM Milestone

AIM Milestone is functionally representative of real user loads in a multitask environment. It measures system utilities speed and capacity for UNIX systems. (Metric: Utilities Index)

SPEC SDM

Measuring CPU, memory, compiler effectiveness, and I/O subsystems. SPEC SDM is representative of a UNIX software development multitasking environment. It also has a multistream metric for multiple processor systems. (Metric: Peak Throughput at scripts/hour)

TPC-A

This benchmark measures CPU, memory, I/O subsystems, terminal handling, and database performance. TPC-A is an online transaction processing benchmark and is database dependent. Some vendors use client/server or front-end/back-end configurations. (Metric: TTP-A and SK/TTP-A)

TPC-B

Measuring CPU, memory, and I/O subsystem and database performance. TPC-B should be used to compare relative performance of database managers. It does not, however, contain representative user interaction via terminal handling or think time. (Metric: TTP-B and SK/TTP-B)

Dhrystone

Dhrystone measures integer processor and C, Ada, or Turbo Pascal compiler efficiency. (Metric: Integer MIPS)

Whetstone

Whetstone measures single- and double-precision integer processor and FORTRAN compiler efficiency. (Metric: KWIPS or WIPS)

Liapack

This benchmark measures single- and double-precision floating-point using FORTRAN mathematical and scientific applications. (Metric: Sp MFLOPS, db MFLOPS)

CPU2

CPU2 measures CPU, memory, integer, and single-precision floating-point. This benchmark is FORTRAN and fp intensive. (Metric: MVUPS)

X11PERF and GPC/PLB (for workstation graphics)

X11PERF tests aspects of X server performance from simple 2D vectors to complex 3D polygons. GPC/PLB is a set of picture-level benchmarks designed to measure relative performance of CRT-based displays.

NHStone

Measuring NFS server performance. NHStone is one of the very few network environment benchmarks in existence. It measures average response time for NFS transfers as the load on the server is increased.



Free Offer from AIM Technology

Take advantage of AIM Technology's Summer 1992 offer, and get critical benchmark data on the latest computing technology from Digital, IBM, Sun, Hewlett-Packard, NCR, and others. AIM — an independent third-party certifier of vendor performance — is offering a FREE issue of its Summer 1992 UNIX System Price/Performance Guide with your purchase of a one-year subscription (\$29.95). That's five quarterly issues for the price of four. For information, call Amy Yowell at 800-848-8649, or (408-748-8649 inside California).

Benchmarks continued



Which Benchmarks Are Right for Your Applications?

Application	Components	Benchmarks
Office Application	Integer performance, 2D graphics, Disk I/O, Interactivity	SPECint8, SPECint92, AIM, Milestone, AIM II, Dhrystone
Electronic CAD	Integer and floating point math, Cache, 2D graphics, Disk I/O	Linpack, K11PERF, SPECint92, SPECfp92, Whetstone
Mechanical CAD	Floating point, 3D graphics, Memory, Disk I/O	SPECfp92, K11PERF, GPC/PLB, Linpack, CPU2, Whetstone
Database Applications	I/O, Database performance	TPC-A, TPC-B, AIM
Multipurpose Servers	Multitasking, Multitasking, I/O, CPU, Memory, Network interface	AIM II, SPECint8, Whetstone
Scientific Applications	CPU, Floating point, Integer	SPECint92, SPECfp92, Dhrystone, Whetstone, Linpack, CPU2

To find out, establish which components are used in your application. Then, choose the benchmark that measures that component. Use this chart — listing specific applications, their components, and appropriate benchmarks — to help you decide.



If you're in the market for a new VAX 4000, 6000, 7000, or 10000 system or upgrade, you can take advantage of 15 percent cost reductions on selected software and software license upgrades from industry-leading software suppliers, including:

- Andersen Consulting
- ASK Computer Systems
- Cognate Corporation
- Dun and Bradstreet Software
- EEC Systems, Inc.
- Ingres
- Lotus Development Corporation
- Oracle Corporation
- Progress Software
- Ross Systems, Inc.
- SoftwareAG
- Spokenix Computing
- WordPerfect, Inc.

In short, a VAX system or upgrade purchase will guarantee you savings on more than 30 of the most popular business applications on the market today.

As CCC Found Out: VAX Systems Have the Future

Providing user access to a repertoire of more than 1.5 million titles, Copyright Clearance Center (CCC) of Salem, Massachusetts, found the solution to its growing business needs through the implementation of a VAX 6000 Model 610 system upgrade. Also, the company continues to use ORACLE as its relational database technology by taking advantage of last year's limited-time savings on software license upgrades.

Is There A VAX System or Upgrade
in your
business?

**FOLLOW IT UP
WITH SOFTWARE
SAVINGS.**

Initially, CCC implemented Digital's VAX 6000 Model 330 because of the system's powerful CPU, increased memory and storage capacity, and high-speed networking capabilities. ORACLE was selected for its tight synergy with the VAX environment, in addition to its leading technology and third-party applications. What's more, ORACLE was able to provide CCC with SQL*Forms, RDBMS, and 4GL tools to generate applications quickly and to ensure flexibility in meeting business objectives.

With the Digital/ORACLE team, CCC was able to store its right-holder and title information and process the considerable data and transactions necessary for photocopy permission. Plus, the company was able to respond quickly to customer requests and to adapt the system to accommodate future business challenges.

New Programs, New Business, New System Challenges

As CCC business increased, so did the demands on its VAX system. Additional computing power was needed to keep pace with projected growth. To that end, CCC teamed with one of Digital's largest distributors to formulate an upgrade plan that would protect CCC's current investments.

Boosting the current version of VMS running on the VAX 6000 Model 330 to VMS version 5.3 set the stage for an upgrade to the VAX 6000 Model 610. After only a two-hour conversion process, CCC gained ten times the computing power — without any disruption to its users. In addition, the upgrade allowed CCC to add 15 terminals, a new controller, increased I/O capabilities, and additional memory to accelerate the process and to cut database queries to sub-second response times.

With the purchase of this system upgrade, CCC acquired an ORACLE software license upgrade at a 15 percent savings.

Today, CCC continues to team its VAX system with ORACLE software to provide faster and better communications to publishers and customers.

For more information on VAX systems or software savings, call 800-DIGITAL (800-344-4825), press 2, and request ext. 24V.

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What's new in computing? Find out by using the Electronic Connection. Digital's online information and ordering service — all you need is a VT-compatible terminal or PC and a 1200/9600-based modem. Simply dial 800-234-1998 between 7 A.M. and midnight EST, 365 days a year, for access to:

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- Configuration tools
- Up-to-date pricing
- Software demos
- Training course descriptions
- Scheduling shipping manuals

What's more, you can use the Electronic Connection to work up price quotes, or place orders directly with an approved credit agreement, reducing paperwork and turnaround time. All quotes come with 60-day price protection, and all Digital Business Agreement and GSA discounts apply. Plus, FASTship service — next-business-day shipping — is available for many Digital products.

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- Utilize DECdirect's toll-free fax line at 800-234-2298.
- Access Digital's online Electronic Connection by dialing 800-234-1998 at 1200 or 9600 baud, from any Digital-compatible terminal or PC.

For more information on Digital's FASTship service, or to receive a copy of the latest DECdirect catalog, call 800-DIGITAL (800-344-4825), press 2, and request ext. 623.





GETTING THE FACTS

YOU'VE HEARD THE STATEMENTS about Digital's high-performance Alpha technology:

Digital is paving the way to twenty-first century computing ... Today's VAX systems are Alpha-ready ... Your initial investment will always be protected.

Sounds good. But, you still have questions. You want more information — about Alpha itself, the migration process, and the service offerings that will be key in paving a flexible and cost-effective pathway to better computing solutions for the future. Here, Peter Jansen, Digital Services Alpha Program Manager, answers some of your most commonly asked questions regarding Alpha, and its ability to see your business through to the twenty-first century and beyond.

Q1. Why should I change or move to Alpha?

A. Alpha represents the technology platform that will take today's computing environment well into the twenty-first century. With Alpha, the performance, productivity, and efficiency that you already have with VAX and DECsystem platforms is significantly enhanced. For example, Alpha extends your ability to:

- Access large decentralized and distributed databases, using object-oriented technologies
- Integrate knowledge-based systems and rules
- Integrate voice, data, and images
- Handle volumes of data movement.

In addition, the "openness" of Alpha technology will provide you with flexibility, long-term investment protection, and operational performance improvements. Digital will initially offer OSF, NT, and OpenVMS Alpha systems. OSF and OpenVMS will have the same open features available on today's VAX and DECsystem platforms.

Digital Services can support you in the process of reengineering your overall business, downsizing to a distributed client/server environment, and integrating Alpha into your existing computing environment — whether that environment is based on a current VMS, ULTRIX, non-Digital UNIX, or proprietary platform. Service offerings include:

- Specific application porting services
- Overall conversion and supporting tools
- Configuration services
- System management support, such as performance tuning and capacity planning
- Network design and management services
- Customer training and consulting services
- Hardware and operating system support on both Alpha and multivendor platforms.

All in all, Digital can provide a complete single source of support for your open computing environment.

Q2. Does migration to Alpha mean costly change and/or obsolescence of current computing equipment?

A. No. In fact, Alpha was designed to be integrated into your existing computing environment. This means you can take immediate advantage of improved system performance while maintaining compatibility with the computing environment already in place. Moreover, Digital can assist you in protecting your hardware/software investment by offering a flexible portfolio of migration, assessment, porting, configuration, and consulting services — whether you are evolving from an existing VMS or ULTRIX platform, or moving from another vendor's platform.

We have also set up Application Migration/Resource Centers throughout the U.S., Europe, and the General International Area (GIA) — centers that are designed to assist you in planning and implementing Alpha into your environment. Our new focus on multivendor support allows you to choose one vendor to manage your complete training needs, regardless of the technology or application.

Alpha's high-performance platform will pave the way for several emerging technologies such as AI, object-oriented databases, imaging, and multimedia. This will allow you to implement the system architecture necessary to support your business processes in order to maintain a competitive advantage.

Q3. As an OSF or future NT customer, will I be forced to migrate? As a VMS customer, will I be forced to move?

A. The answer to both questions is no. Alpha will support OpenVMS, OSF, and NT — and all three operating systems will be compatible within their respective orientations. Also, all three systems will be compatible with many of the same industry standards. Digital's technology assessment consulting services can help you determine the environment that is truly optimal for your business.

ON Alpha Services

As a VMS customer, you will not be forced to move. In fact, since OpenVMS will be offered with Alpha, you can integrate into your existing computer environments and run your existing applications through a simple recompilation process. As a result, you will be able to maintain a single-VMS source.

In response to questions concerning other computing environments:

• **ULTRIX customers** will be able to move their applications to OSF with minimal effort — just like our VMS customers. Because OSF is based on the OSF standard, all applications based on OSF specifications will recompile and execute under Alpha.

• **Applications developed under POSIX** will move between OpenVMS and OSF as well as other POSIX-compliant systems. OpenVMS has also received UNIX-BASE branding from the XOPEN Consortium.

• **Microsoft** will be offered with NT from Microsoft and will support any NT application.

Most applications will recompile and execute under Alpha. Some applications can take maximum advantage of Alpha's performance capabilities as a result of tuning and performance optimization work.

Digital will support you with open training courses, such as our recently announced support for all Microsoft course offerings. In addition, qualified consulting services will help you build an open multivendor environment. All in all, Digital's consulting and training services will help you rethink, reengineer, retool, and reenergize your business processes.

Q4. What is Digital doing to help me understand the need to plan for change and to help manage my computing environment?

A. We offer a full portfolio of Alpha services designed to assist you in the planning, design, implementation, and management aspects of Alpha as you begin to integrate and utilize this new Digital technology. These include:

Consulting Services

These offerings are designed to help you understand how to maximize the advantages of Alpha technology in redefining your business processes and in designing your information technology plan for the future.

Application Services

Providing a range of offerings, including tools and assistance, these services help you to fully integrate Alpha into your existing computing environment.

Configuration Services

These services are designed to assist you in understanding how to take maximum advantage of Alpha technology.

Learning Services

Offerings in this category are designed to provide your employees with training on Alpha technology and related products. Courses such as change management are also offered to help management deal with the evolving computer technologies of the '90s.

Hardware, Software, and Network Services

These services not only support Digital's Alpha products, but also provide multivendor support offerings, such as LAN integration, multiple OS support, hardware services, and support for industry-standard applications.

Q5. Will I get stuck if I don't move to Alpha? In other words, will technology and support pass me by? On the other hand, if I choose to move to Alpha, will my current equipment become obsolete?

A. Whether you choose to move to Alpha — or choose not to at this time — you most certainly will not "get stuck." We will continue to provide enhanced Alpha-ready VAX systems that are board-upgraded to Alpha, as well as ongoing service for both VAX and DECsystem platforms. What's more, you will continue to receive all the advantages of OpenVMS and OSF whether you use VAX platforms, DECsystem platform, or Alpha.

Applications currently used on VAX will be available on Alpha. To this end, we are working with software vendors to ensure the availability of more than one thousand initial applications for Alpha — with many more to follow.

Q6. How does Alpha fit in with Digital's ongoing service strategy?

A. Alpha provides the industry with a proof point of Digital's commitment to Open Systems and continued price/performance leadership — the kind of price/performance leadership already offered by VAX systems. This commitment to Open Systems is supported by the licensing of the Alpha architecture, industry-standard operating systems (OSF, NT, OpenVMS), and broad-based applications support. Alpha supports, enhances, and enables Digital as a leading-edge, Open Services company — strategically positioned to be a single-source provider of multivendor services and systems integration capabilities.

Alpha can be a key enabler for you by providing key opportunities to reengineer unproductive business practices. Digital Services plays a leading role in providing you with the consulting and assessment needed to maximize your business opportunities.

For more information on Digital's Alpha Services, call Peter Jansen at 508-496-8857.

Your Financial Picture with Digital Leasing

Along with the general benefits of stretching your technology budget and implementing your business plans quickly, certain types of leasing can favorably "window dress" your company's financial statements — positioning your organization as one that is stronger, more liquid, and more profitable. To that end — and for maximum benefits from your leasing options — it's important that you distinguish between the operating and the capital lease.

Capital and Operating Terms Defined

A lease contract that is a true rental arrangement is called an operating lease. In this type of contract, you have full use of the system, while the lessor maintains system ownership. The operating lease is, in both form and substance, a lease.

However, a lease contract that transfers the characteristics and benefits of system ownership in you is called a capital lease. Although a lease in form, the substance of this type of transaction is that of a purchase — and treated just like any other company asset that has been purchased.

In other words, a capital lease is shown, or capitalized, on your financial statement as an asset. At the same time, a corresponding liability of the same dollar amount as the asset is recorded on the balance sheet. This liability is amortized over the life of the lease the same as the outstanding debt on an installment loan.

Classifying Your Lease

A capital lease reflects ownership, whereas an operating lease reflects usage only. In determining the classification of a lease — either capital or operating — the Financial Accounting Standards Board No. 13 (FASB 13) uses the following four criteria:

- The lease automatically transfers ownership in the lease.
- The lease contains a bargain option.

- The lease term is equal to 75 percent or more of the estimated economic life of the leased property.

- The present value of the minimum lease payments, at the beginning of the lease term, equals or exceeds 90 percent of the fair market value of the property.

If any one of these four criteria is met, the lease will be classified as a capital lease. If none is met, the lease becomes, by default, an operating lease.

The Operating Lease Points a Pleading Financial Portrait

In the case of an operating lease, the leased system is not capitalized nor is the

corresponding liability recorded on the balance sheet. What's more, the only expense appearing on your income statement attributable to the lease would be the lease rental expense.

This type of off-balance-

sheet financing has many advantages, including dressing up your financial statements by improving your company's financial ratios, at least initially. As the operating lease does not create a liability on the balance sheet, your organization also appears to be less leveraged — making your financial picture more appealing to potential lenders. In addition, an operating lease helps you lower your asset base, as well as increase your reported earnings. In short, an operating lease enables you to remove a

portion of your debt obligation from the balance sheet. Thus, your financial statements — and your entire organization — appear more solvent and less encumbered by debt.

Making your financial statements look as strong and healthy as possible to shareholders and lenders is high on your list of priorities. The use of operating leases can help you achieve this goal.

Take Advantage of Digital Leasing

Leasing — operating or capital — is one of the most popular and economically sound means of acquiring computer equipment today. Find out how your company can benefit from leasing Digital products by calling 800-322-3239 (or 600-343-3451 inside Massachusetts). We'll put you in touch with one of our leasing experts, who can answer your questions and provide you with a FREE copy of *An Executive Guide to Computer Leasing*.

TurboWare Packs Your System with HIGH-PERFORMANCE PUNCH

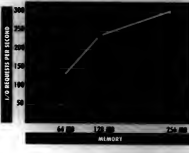
Digital and EEC Systems have great news for VAX 4000, 6000, 9000, and MicroVAX system users. It's called TurboWare — a performance package of Digital memory and EEC Systems SuperCache.

SuperCache, a software accelerator for VAX VMS systems, runs automatically and can generate significant performance improvements — as much as 2 to 15 times your current performance — within seconds of installation.

Utilizing caching technology, SuperCache uses 100 percent of your system's free memory to move data from frequently used files into main memory. However, it has the ability to return memory back in VMS upon demand. For high-performance results, it is necessary to have at least 10 percent or more free memory when using SuperCache — the more free memory available for caching, the greater the performance results achieved.

SuperCache capabilities combined with Digital high-performance, high-reliability memory options make TurboWare the ideal solution for all your applications, especially read-intensive applications. TurboWare increases system performance by eliminating I/O bottlenecks caused

by slow disk response time.



Now good is the SuperCache/Digital Memory team? The graph shows a doubling of I/O requests per second when SuperCache is added to a VAX 6240 (64 MB), running a software development testing application. What's more, the graph displays a continued increase in I/O requests per second being serviced as more Digital memory is added.

INTELLIGENCE FILES



Items of interest from publications, speeches, surveys and research projects

Patience pays

■ It's a common mistake for companies to set short-term financial goals for advanced manufacturing technology, according to Carol Beatty, an associate professor of management at Queen's University School of Business in Kingston, Ontario. Beatty, who recently completed a four-year study of advanced manufacturing implementations at 10 companies, says this approach almost always guarantees disappointment because many such projects take at least a year, often two, to install — and even then usually don't produce immediate benefits.

Only half the companies that try to implement advanced manufacturing technology actually reach their original goals, she says. The other half wind up dead-ended or off-track, usually because of management problems.

Source: "Implementing Advanced Manufacturing Technologies: Rules of the Road," by Carol A. Beatty, Sloan Management Review, Summer 1992.

Games CEOs play

■ Management consultant Charles F. Hendricks says he sees much of the current reorganizational activity in corporate America as shallow, knee-jerk reactions that give chief executive officers something to point to but generate little in the way of productive change.

"It is not a coincidence that terms such as *restructure* and *downsize* dominate management thinking," Hendricks writes. "Tables of organization and staffing are tangible — you can see them, you can count boxes, lines and people and, most importantly, you can write them down on a piece of paper. . . . CEOs, when they appear to be losing ball games, restructure and downsize and then show the investment community another piece of paper to demonstrate that they are in control — they are organized. 'So it is written, so it is done!'"

Source: "The Righting Remedy: How Managers Can Respond to the Downsizing Dilemma," by Charles F. Hendricks, published by the Society for Human Resource Management and BusinessWeek Press.

Give to get

■ Whitmire Distribution, a Folsom, Calif.-based wholesale distributor of pharmaceuticals, invested three years devel-

oping an inventory management system, which it provides free of charge to its 7,000 customers.

Reportedly, many customers have been able to reduce their on-site storage by up to 40%.

Source: *Financial Strategies* section, Inc. magazine, August 1992.

Intelligence barriers in Europe

■ Collecting information on the competition can be tough for U.S. companies operating — or planning to move operations into — European countries, according to *International Business*. While business information is fairly accessible in the UK, Sweden and Belgium, many other countries present consider-

able challenges.

Among the toughest are the Netherlands, where public records on businesses are scattered in local town halls, and Germany, where the data protection law passed to protect individuals is also often used by companies to avoid releasing even basic information such as the number of employees on their payroll.

Source: "Super Sleuths," by Dave Semmel, *International Business*, May 1992.

Surviving the maquiladora outfit

■ Hundreds of U.S. companies have opened assembly plants called "maquiladoras" across the border in Mexico to take advantage of Mexico's low labor rates and then send the assembled prod-

ucts back to the U.S.

However, to be sure that the products qualify for low import tariffs, the U.S. Customs Service must be able to audit the organization's cost accounting systems.

Companies must provide the government auditors with read-only access to the accounting systems and with programmers who can retrieve and sort the necessary data.

Source: "Maquiladoras, From an Auditor's Point of View," by Willie del Barrio et al., *Global Trade Talk*, July/August 1992.

Compiled by features editor Joanne Kelleher with contributions from Mick Pettis, national correspondent.

Datapro rates TMON for CICS tops in user satisfaction

Computerworld buyers scorecard ranks TMON for MVS first

Eyewitness chalks up highest rating in Xephon user study

The Monitor for VTAM shines in Xephon survey

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tools is based — takes you straight from problem to solution.

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There's nothing innovative about copying.

On Friday, July 31, 1992, a U.S. District Court ruled that Borland's Quattro® and Quattro Pro® spreadsheets infringe the copyrights of Lotus® 1-2-3®.

In its ruling, the Court concluded that "... the Quattro programs derive from illicit copying," holding that "Lotus has sued" and "Borland is liable."

Lotus innovated. Borland copied.

We sued to protect our intellectual property rights. And in winning we've helped preserve an environment in which independent software developers can freely develop innovative new products without fear that their creative work will be stolen. We sued to protect innovation, not to stifle it. Borland's copying is no different from someone plagiarizing *The Grapes of Wrath*, changing the ending, and calling it a new novel. It's really that simple.

But the courtroom is just one of the places where Borland® has lost.

They've lost in the marketplace, where 1-2-3 for DOS continues to dominate. Based on a recent report from the Software Publishers Association®, Lotus 1-2-3 accounts for seven out of 10 new DOS spreadsheet purchases and over 80% of all DOS spreadsheet revenue.

They've lost in performance categories, despite their claims to the contrary. For example, in a recent National Software Testing Laboratories performance test,** 1-2-3 Release 2.4 beats Quattro Pro 4.0 hands down in areas users care about most. The tests reveal that 1-2-3 Release 2.4 is four times faster than Quattro Pro 4.0 in retrieving a WK1 file; 18 times faster at moving a block of data; three times faster at product load; one-and-a-half times faster at printing; and 35 times faster scrolling right or left in graphical mode.

They've lost on the innovation front, too. Lotus 1-2-3 was the first DOS spreadsheet to introduce innovative technologies such as true 3D worksheets, the Viewer, WYSIWYG display, DataLens®, and unique one-click SmartIcons.® And we're still the only spreadsheet that offers true compatibility across platforms.

Who should you trust?

But perhaps most importantly, Borland lost what matters most to customers: credibility.

For instance, Borland told the Court they needed to copy our menus to achieve macro compatibility with 1-2-3. Now they tell their customers that the 1-2-3 menus aren't critical to compatibility.

So ask yourself: to what extent can you trust a company that values what is expedient over what is legal? And to what extent can you rely on the product it wants you to buy?

Here's our advice: choose the product, and the company, you can trust. Choose Lotus. After all, we're the best in the business at building innovative spreadsheets. Always have been, always will be.

Case closed.

The Lotus logo, consisting of the word "Lotus" in a serif font inside a dark rectangular box.

*Based on Software Publishers Association survey and user share data, May, 1992. For further details, see "1-2-3® spreadsheets used in 27% of all spreadsheets in 1992" at 1992 Lotus Development Corporation. All rights reserved. Lotus, 1-2-3 and SmartIcons are registered trademarks and Quattro is a trademark of Lotus Development Corporation. Quattro, Quattro Pro and SmartIcons are registered trademarks of Lotus Development Corporation. 1992 and 1993 are registered trademarks of Lotus Development Corporation.

You can't be fired for innovation

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is **R. Max Steiner**, a marketing director at **Contract Solutions, Inc.** located in Salem, N.H.

Q For the past three years, I have been developing my own database product. I believe I will have an excellent product to market. Can I be fired for developing my own product?

A Whether or not your employment is dependent on your contract and any potential existence of a conflict of interest.

In most cases, you cannot be fired for trying to market a product of your own invention. However, you must not be in conflict with your current employers. Once you have prioritized your personal goals with your employment obligations, make sure you are not violating any contractual issues.

Do not attempt to develop a product that is competitive with your employer's. And never use your employer's invention or equipment to aid in your development efforts.

Q I am a programmer/analyst. Our department is using a System/38 and has no

immediate plans to move to an Application System/400, so there's not much opportunity to expand my experience. Besides, I wish to work in a personal computer or workstation environment. What can I do?

A Volunteer at a nonprofit organization whose work you support. These groups are often in need of technical people to help with their databases. This would allow you to give back to the community, while at the same time expanding your skills.

FAST TRACK CAREER ADVICE FOR THE '90s

Q I am a principal analyst at a large financial services organization. I have been approached about a possible management job and am unsure whether to accept. I do not want to wake up one day with my technical skills no longer in demand.

A First, take pride in being offered a promotion. Second, forget management vs. hands-on and focus on your own feelings. Do you feel challenged in your job? Is your company financially secure? Do you have a sense of

loyalty to your company? If your answer to all these questions is yes, then accept your promotion with enthusiasm.

Once a decision is made to stay and pursue this promotion, then tackle the issue of management experience vs. hands-on experience.

Q If you pass an exam for certified computer programmer (CCP), certified data processor (CDP) and certified systems professional (CSP) and have these acronyms attached to your name, does it help you in your career?

A I have always questioned the effectiveness of certification programs. I have never had a client require certification in the backgrounds of candidates. I place. Based on this experience, I would say that these programs do not help your career.

I do wish to stress that these programs can be useful. A person can take these certification tests to enhance his sense of professional worth.

✉ We want to hear from you. Call your career questions in using the Fast Track line at (508) 875-8332, send them via MCI Mail to KDWYER or send them by fax to Kelly E. Dwyer at (508) 875-8331. Letters may be edited for brevity and clarity. If we use your question, we'll send you a gift.

TIP of the MONTH

How to turn down overtime without damaging your career

► Try to negotiate when the overtime is put in as opposed to saying no. We'll accommodate a shift of work hours if people can focus on a deliverable better than they way over a short period of time.

*Iravin Bernstein, vice president, Planning/administration
Maidenform, Inc., Bayonne, N.J.*

► Let your boss know you have plans before you're asked by dropping him (or her) a note. We have weekly meetings here and talk about a lot of things - and availability is one of them.

*Dennis Love, IS director and vice president
Actel Thermal and Supply, Inc., Los Angeles*

► If there's a good reason for declining, that's OK. But the staff should be flexible for critical business applications, and management should be flexible for personal emergencies.

*Rogis Garbo, director, data center and telecommunications
Lever Brothers Co., New York*

► You would have to choose very carefully when you turn down overtime because having a commitment to your career is part of moving through the management ranks.

*Julie St. John, vice president of transaction processing and management
Fannie Mae, Washington, D.C.*

► There are sometimes legitimate, unexpected needs for overtime. Crises happen and deadlines flip, and people have to pitch in. Overtime can be an opportunity for recognition and advancement. But mandatory overtime - no management's part - is fair-based, expedient and oppressive.

*Brian Graham, project leader
Administrative information services
Columbia University, New York*

Compiled by Leslie Coffey, a free-lance writer based in New York.

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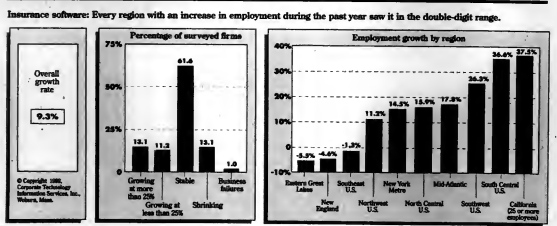
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MARKETPLACE

In search of better phone support



BY ALICE LAPLANTE
PHOTO BY TONY

Raymond Geitka had a simple question: Was the latest version of Textra, the standard personal computer-based word processor being used at his organization, available in a network version?

One day and seven long-distance phone calls to various parts of the country later, he got his answer—but not from Santa Monica, Calif.-based Peter Norton Computing, Inc., the company that sold him the package. "I just got bounced from one person to another," says Geitka, director of computing services at the University of Michigan in Dearborn.

The road to getting answers to software and hardware questions over the phone is not all often just as long and winding as Geitka's.

You can take the time to establish strong phone support from

your vendor, but on the whole, information systems workers say it's not uncommon to suffer long waits on telephone hold, "not my department" brush-offs or—the worst—incoherent answers from technically inept people.

A survey by the Corporate Association of Microcomputer Professionals (CAMP) in Northbrook, Ill., shows that callers in search of support were placed on hold more than 77% of the time. Once on the line, support representatives weren't able to provide a solution 53% of the time.

Not all bad

It's not as though everyone is unhappy with telephone support. Research from Dataquest/Ledgerway in Framingham, Mass., shows that approximately 25% of users say telephone support is "ideal," and only a small percentage say it is "unacceptable." Fifty percent rated support "acceptable," which they defined as having between 67% and 87% of their questions answered correctly on a first call.

Although CAMP's results fall within this "acceptable" range, it's by a small margin, which indicates that vendors are not passing the support test with flying colors.

It doesn't help matters that it's new employees who often staff support lines. Another complication in the merger, acquisition and consolidation of companies

in recent years. This was the case for Geitka. Although he had purchased Textra from Peter Norton Computing, the product was developed by another company, which is where he eventually found help. "Sometimes you have to go to the source in order to get an answer, but finding that source can be difficult," Geitka says.

Connections helpful

One way to get better telephone support is to know someone. IS managers suggest cultivating a personal relationship with someone in the vendor organization, through phone calls and other interactions. They warn to avoid overburdening "inside" sources by calling only when the problem can't be solved through the formal support hierarchy.

Offering to be a beta-site or doing a vendor a favor can also result in special treatment.

"If you are willing to work with your vendor, they will go the extra mile for you," says Dave Burns, manager of systems and programming at Mueller Brass Co. in Port Huron, Mich. "Because Wang service people know us personally and can borrow equipment from us in a pinch to service other customers, we get rapid response when we really need help."

Part of learning the ropes is keeping careful records of who you last spoke with and how helpful they were.

The Fuller Co. carefully tracks the quality of support for all 12 of its software vendors and ranks them annually, says David Pinkus, manager of MIS at the Lehigh Valley, Pa.-based firm.

When it's time to renew a licensing contract, it helps to know the kind of service the vendor has been providing, Pinkus says. "Whenever I meet with a vendor, I'll always bring up where they rank in our survey and ways they can improve," he says.

It's hard to predict from the outset what kind of telephone support you're going to get. The software vendor who ranks 12 out of 12—dead last on Fuller's list—is one of the largest and best-established software vendors in

the world.

"You have to go through 37 different levels of voice mail in order to get to the right person," Pinkus says. On the other hand, another Fuller vendor is "one guy who works at home and debugs software while holding a baby in his arms," he says. "He gets a very decent rating because we can always reach him."

A lot of finger pointing goes on among vendors, Pinkus adds. "If a vendor doesn't have an answer or the resources to get me an answer, I'd rather they were honest about it," he says. "Then at least I know where I stand."

LaPlante is a freelance writer based in Palo Alto, Calif.

Support wish list

Here's what users find ideal in a vendor's telephone support offerings:

- A fax-on-demand service that knows answers to complex technical questions.
- Problem-tracking software to track a customer's history of problems and support requests.
- Notification of where they stand in the "hold queue" and how long they are likely to wait.
- Easier access to the developers of the product.
- Elimination of "callbacks" for simple or routine questions.
- Access to an on-line bulletin board to leave support requests and have them answered electronically.
- Access to an on-line database of common technical problems and solutions.
- Expertise on the ways different products from different vendors interact.

Source: Corporate Association of Microcomputer Professionals, Northbrook, Ill.

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"In addition to delivering advertising results, the issue's Annual Student Survey serves as an important research tool. Upon receiving data on how students typically view Hughes Aircraft, we felt we needed to strengthen our image in this area. For continued success in recruiting top technical talent, we find feedback like this invaluable.

"To be effective, it's essential that our recruitment advertisement appears in a quality publication that students will read. We know *Computerworld's Campus Edition*, with its meaningful content, will have a long shelf life. Clearly, it's a publication that students will take back to their rooms pass along to fellow students, and keep for future reference. That means our advertisement in *Computerworld's Campus Edition* keeps right on working long after the issue date.

"Again this October, we'll be relying on the cost-efficient reach of *Computerworld's Campus Edition* to take our recruitment message to engineering, computer, and business graduates at leading colleges and universities nationwide."

Computerworld's Campus Recruitment Edition. On October 31, 1992, this exclusive edition reaches 150,000 top students enrolled in America's top computer and engineering degree programs. It's an advertising vehicle that works for John Wilhite at Hughes Aircraft. And it's your best way to recruit America's best computer career students. For all the facts, call John Corrigan, Vice President/Advertising Director, at 800/343-6474 in MA, 508/879-0700.

**Your best way to recruit America's
best computer career students ...**

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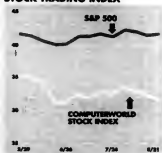
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Computerworld Friday Stock Ticker

STOCK TRADING INDEX



Industry Almanac

FOCUS ON SOFTWARE

Software Scene
Donaldson, Luffin & Jenrette Securities Corp.
New York

Aug. 1, 1992
 Slowdowns in fiscal second-quarter earnings hurt many software firms' stock prices; only a handful have climbed since the end of May. Investor enthusiasm will not spark until earnings have either stabilized or accelerated.

Expect client/server offerings from Cognos, Inc. (COGN), which is slated to ship PowerHouse Windows for Unix this summer. Business is churning faster for Ross Systems, Inc. (ROSS). The company, which traditionally caters to Digital Equipment Corp. (DEC) users, is now targeting—and making progress in—Unix and client/server markets as well.

LISA DAVIDSON

Assembling software

A gathering of current brokerage ratings

Company	Rating	Buy	Hold	Sell
Aldus Corp.	Neutral		Hold	
Artisoft, Inc.	Strong buy		Not rated	

Autodesk, Inc.	Neutral	Not rated		
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Borland International, Inc.	Buy	Hold		
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Computer Associates International, Inc.	Buy	Not rated		
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Lotus Development Corp.	Buy	Hold		
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Microsoft Corp.	Strong buy	Buy		
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Sterling Software, Inc.	Buy	Buy		
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Sungard Data Systems, Inc.	Buy	Hold		
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TOP PERCENT GAINERS

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

TOP PERCENT LOSERS

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

TOP DOLLAR GAINERS

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

TOP DOLLAR LOSERS

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

Communications and Network Services

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

PC and Workstations

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

Large Systems

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

Software

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

TOP PERCENT GAINERS

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TOP PERCENT LOSERS

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TOP DOLLAR GAINERS

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10.0	10.0	10.0	10.0	10.0

TOP DOLLAR LOSERS

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10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

Semiconductors

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

Peripherals and Subsystems

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

Services

10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0

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APR

COMPUTER INDUSTRY

IN BRIEF HP Q3 sales off 1%

■ As expected, Hewlett-Packard Co. last week posted third-quarter earnings of \$191 million, off 1% from the year earlier period. Revenue for the quarter ended July 31 increased 15% to \$4 billion. The Palo Alto, Calif.-based company attributed the earnings decline to a mixed sales environment: Demand for high ticket items was soft, while purchases of lower priced items remained strong. Meanwhile, HP was hit with a securities fraud, class-action suit following a 17% decline on Aug. 7 on the price of its common stock after the firm's disclosure of lower-than-expected financial results [CW, Aug. 10]. HP said the suit is without merit.

■ Dell Computer Corp. announced record sales of \$457 million for its fiscal second quarter, a 129% increase from the year earlier period. Net income in the quarter ended Aug. 2 increased 77% to \$21.9 million. The Austin, Texas-based company said Dell's strong showing contrasts starkly with less-than-stellar results recently revealed by Zeos International Ltd. and Northernlight Computer Systems, Inc.

■ Cisco Systems, Inc. reported fiscal fourth-quarter net profits of \$13.2 million, up 100% from the comparable period last year. Revenue rose 95% to \$110.7 million in the quarter ended July 26, the Menlo Park, Calif. company said.

■ Sequoia Systems, Inc. reported a fourth-quarter net loss of \$860,021 compared with a profit of \$2.6 million in the corresponding period last year. Revenue in the period was \$71 million, up 12% from the same period last year, the Marlboro, Mass. company said. The company attributed the loss to lower than expected sales related, in part, to delays in closing major transactions, the write-off of uncollected receivables and tightened credit terms.

Trade pact could spur exports to Mexico

Agreement offers vendors alternative to Far East manufacturing but could cost domestic jobs

BY GARY ANTHES
COWLEY

WASHINGTON, D.C. — U.S. vendors of computer hardware, software and services said the recent free-trade agreement with Mexico will boost sales in the fastest growing market in North America and will provide an attractive alternative to Far East manufacturing sites.

The proposed North American Free Trade Agreement (NAFTA) preserves the tariff-elimination schedule in the 1988 U.S.-Canada Free Trade Agreement, and it will phase out the high duties on computer hardware imported into Mexico from the U.S.

Those tariffs boost the cost of U.S. products in Mexico by about 10% for parts, 15% for subsystems and 30% for complete systems. It will have little impact on U.S. vendors that are pursuing Canadian business.

Big business

"Mexico is our fastest growing Latin American market, even with the 30% tariff," said William Fasig, manager of international government affairs and trade at Apple Computer, Inc. "As the tariffs comes down, obviously that will have a significant impact on

our business."

However, some industry sources said the greatest benefit will not be the reduced tariffs as much as NAFTA's stimulus to the Mexican economy as a whole,

Borderless business

Vendors hope the recent North American Free Trade Agreement accelerates growth in the Mexican and Canadian markets.

U.S. exports of buses and recorded media including software to Mexico and Canada in billions



Source: Office of U.S. Trade Representative

which now supports \$1 billion in annual sales for information technology.

"Mexico is a developing country of substantial size, and it's at the stage of economic takeoff," said Edward J. Black, vice president

and general counsel at the Computer and Communications Industry Association. "Small and large businesses are expanding, and all of them are prime candidates for buying our products."

Cutting red tape

A spokesman for IBM said it welcomed trade reforms that will make it easier for U.S. firms to invest in the Mexican economy. He said that when IBM attempted several years ago to expand a Guadalajara plant that makes midrange systems and Personal System/2s, the company had to spend a lot of time negotiating away various restrictions that would have made the investment untenable. "That process will now be substantially eased," he said.

Perhaps sensitive to the charge that NAFTA will export American jobs to Mexico, and mindful that the agreement has not yet been approved by Congress, none of the major manufacturers pulled by Computework said the agreement would encourage them to open plants south of the border.

But Gary Wilmarth, a computer trade specialist at the Hartford, Conn., law firm of Day, Berry & Howard, said low labor rates, the proximity to the U.S. and the free-

trade agreement may cause some computer and electronic companies to shift operations in the Far East to Mexico.

Black said he supported that scenario and added that it would allow U.S.-based companies to leave some of their senior management and technical people at home where they can commute to Mexico from Florida, Texas or California relatively easily.

Promises, promises

In other terms of interest to the computer industry, Mexico promised to do the following:

- Strengthen intellectual property rights protections with the intent of giving computer software copyrights the same protection in Mexico as they enjoy in the U.S.

- Give owners of software copyrights the right to prohibit the rental of their programs.

- Treat U.S. computer services firms no less favorably than Mexican ones.

- Eliminate discriminatory restrictions on U.S. sales and investments in the \$6 billion Mexican market for telecommunications equipment and services.

- Not discriminate in favor of Mexican companies bidding on government jobs.

IBM jump-starts OEM business with chip deal

Reply says IBM's competitive prices key factor

BY MICHAEL FITZGERALD
COWLEY

SAN JOSE, Calif. — IBM recently landed its first chip customer. Reply Corp., a \$50 million manufacturer of Personal System/2 Micro Channel Architecture (MCA) clones based here, agreed to sell systems that use IBM's SLC microprocessor and random-access memory.

The OEM deal offers a glimpse into how IBM is approaching a new business that it hopes will generate billions in revenue by 1995 [CW, June 15].

Steve Petracca, IBM's president of chief executive officer and a former IBM employee, said, "It's going to take a while for this to close other deals" for the SLC.

"It's not nearly as easy for them to work with other people as it was for me," Petracca said. "I

know which hurdles to jump."

Analysts contacted adopted a wait-and-see attitude about whether this signals that IBM can play a significant role in the OEM market. "If they can't get Reply, they can't get anybody," said Richard Zwetshbaum, an analyst at International Data Corp. in Framingham, Mass. Zwetshbaum described Reply's focus to be on MCA, OS/2 and having a former IBM insider as head of the company.

Persistence pays off

Petracca said he approached IBM about selling the chip to him when it was first announced but was rebuffed. He said his refusal to take no for an answer eventually helped sway IBM. Once IBM agreed to talk with him, the pace of negotiations was surprisingly rapid.

"I said, 'We can get this deal

done in 30 days and ship in 60 days,' and they thought I was crazy, initially," Petracca said. In fact, the first Reply personal computers with SLCs are scheduled to ship within 90 days of initial talks. "I'm sure they'd rather close a big deal with Michael Dell or NCR, but [those companies] can't move as fast as we can."

An IBM spokesman said Reply's small size did help close the deal quickly.

Petracca said he credited IBM with moving "very aggressively" from both a price and delivery standpoint. This isn't the same company I worked for.

Petracca said that IBM's willingness to sell both single and multi-chip SLCs at competitive prices was a key to his final decision to buy the SLC from IBM. Reply's SLC-based systems, which ship today, cost \$1,195, \$1,290 less than IBM's least-expensive SLC-based PCs.

IBM's license agreement with Intel Corp. for the 386SLC prevents it from reselling the chip directly, but it can put it on an upgrade board. Accordingly, IBM and Reply designed a board specifically for Reply's systems.

Petracca called the SLC a major advantage for Reply, which plans to discontinue its line of 386SX-based systems. However, he acknowledged that his company will face significant challenges if IBM's scheduled Sept. 22 PC announcement is as sweeping as some expect.

"I'M SURE they'd rather close a big deal with Michael Dell or NCR, but [those companies] can't move as fast as we can."

STEVE PETRACCA
REPLY

Nonetheless, "We've committed to our customers that we'll save them a certain percentage. We have the capability to do that," Petracca said.

Reply recently cut prices by as much as 45%. The company's systems now sell for half the price of comparable IBM systems.

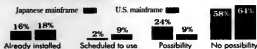
TRENDS



The status of application backlogs, Unix and other software issues in Japanese and U.S. companies

Opening up

27% of responding U.S. IBM mainframe sites are very likely to implement some form of Unix in the next 12 months compared with 18% of Japanese sites



Selection priorities

When choosing software, innovative and easy-to-use products are high on both countries' lists. Details such as documentation and support concern the U.S. more.

	Japan	U.S.
Ease of use	28%	23%
Features	23%	24%
Price	15%	13%
Support	8%	13%
Documentation	6%	18%

Backlog fix

Application backlogs are common for all, but preferred solutions vary considerably

Top 3 Japanese solutions:		Top 3 U.S. solutions:	
Limit investment in hardware/software	38%	More use of productivity tools	31%
Hire or develop IS professionals	17%	Purchase packaged software	20%
Development support tools	14%	Retain outside programmers	16%

For companies with more than 1,000 employees

Base: 1,992 Japanese MIS directors; 1,940 U.S.-based senior software managers

Source: Sentry Market Research, Westboro, Mass.

CW Chart, Janell Gervase

Thinking growth

Japan's software market is relatively small compared with the U.S., but it's growing fast



INSIDE LINES

Better late...

► Computer Associates is definitely getting serious about microcomputer software. At the opening of last week's Systems Software Conference in New Orleans, Phyllis Palladian, the conference chairwoman, told the 1,200 attendees that CA was offering up to \$1,000 worth of free micro software to each user in attendance. Though micro software sales make up only 10% to 12% of CA's \$1.5 billion in annual revenue, the Islandia, N.Y., software giant hopes to leverage its large mainframe-oriented customer base with downsized PC-based applications.

Up the down escalator?

► It looks like IBM is not far away from hitting the mass market channels with new machines. In preparation for its big Sept. 22 product blitz, Big Blue is loading the channel with new configurations that have preloaded software — although whether the software is Windows is unclear. Sources say Service Merchandise will sell a \$1,900 20-MHz 486SX PS/1.

Rainbow over the horizon

► Late September marks the introduction of the first color pen-based system. Daughin Technology will announce the Daughin 5500 Prestop, a 5½-inch system with an STN (passive-matrix) screen. Inside is a 25-MHz Intel 80386SL chip, 4M bytes of RAM and an 80M- or 130M-byte hard drive. Pricing was not available. IBM and NEC are expected to bring out new versions of their pen-based products next month as well.

Server flexing

► One user interested in Compaq's upcoming server announcement, which sources have pegged for NetWorld in October, will be expected to see a 100-MHz 486 machine from the folks in Houston. He also expects to see a radical System-Pro redesign, which could reflect the TriFlex architecture that has already been talked about. But some users are worried about compatibility between the new and the old Pro.

Stacked DEC

► DEC will shortly disclose a modular storage strategy replete with plug-and-play products. Users will be able to integrate a range of controllers and swap adapters for DEC's CI, VMS or SCSI-2 buses. These can then be attached to disk drives ranging from 2.3 in. to 5½ in. or a mix of tape and optical devices. Initial products will include a box that combines CI, SCSI SCSI and also FDDI, sources said. Software RAID implementations will also be available so users will be able to reconfigure their disk arrays to be compliant with either RAID-1, -3 or -5, according to an application's needs.

Parents spurned

► Not all Sears and IBM enterprises have signed up for the companies' new joint network outsourcing venture, Advantia. IBM/Sears joint venture Prodigy, the consumer information company, just extended its contract with Advantia rival BT Tymnet for another few years.

Aloha means hello and goodbye

► As their employer filed Chapter 11 last week, selected high-producing sales reps from Wang Labs parted in Hawaii, blissfully removed from the how-to-beck on the mainland. The vacation was part of Achievers' Week, a program begun during Wang's heyday under former President John Cunningham to reward salesmen who best quotas.

Word is that Apple USA Chief Robert Puetz has fallen out of favor with the company's directors and may now resign. Industry watchers say ex-HP exec Puetz alienated Apple top brass with his reluctance to enter the mass market now ruled by IBM-compatible PCs. Puetz's stature took another hit last month when he was moved under Ian Derry, formerly his counterpart at Apple Pacific. If there was a swap opera about Apple, would they call it As the Worm Turns? Bad puns aside, phone, fax or CompuServe news tips to News Editor Alan Alper at (800) 343-6474, (508) 875-8831 or 765372413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

NEXT WEEK

Which path? Is the ticket to the CIO suite an MBA? Or a master's in computer science? Or both? Next week, Computer Careers traces the career paths of Nick Rudd, CIO at Young & Rubicam, and Rich Nydick, vice president of IS at the Hibbert Group, to answer the age-old question. Their experiences may surprise you.



Charles Ledger

While OS/2 Version 2.0 holds promise with its ability to multi-task DOS and Windows applications, potential users with certain mixed-vendor environments need to be cautious, consultant Fabian Pascal says. Pascal, who has a non-IBM hardware setup, reveals some OS/2 quirks and how to get around them. See In Depth.

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Sun Microsystems
Computer Corporation

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